

**Step by Step guides to master
Oracle Database Cloud Service – DBaaS**

<http://www.kamranagayev.com>

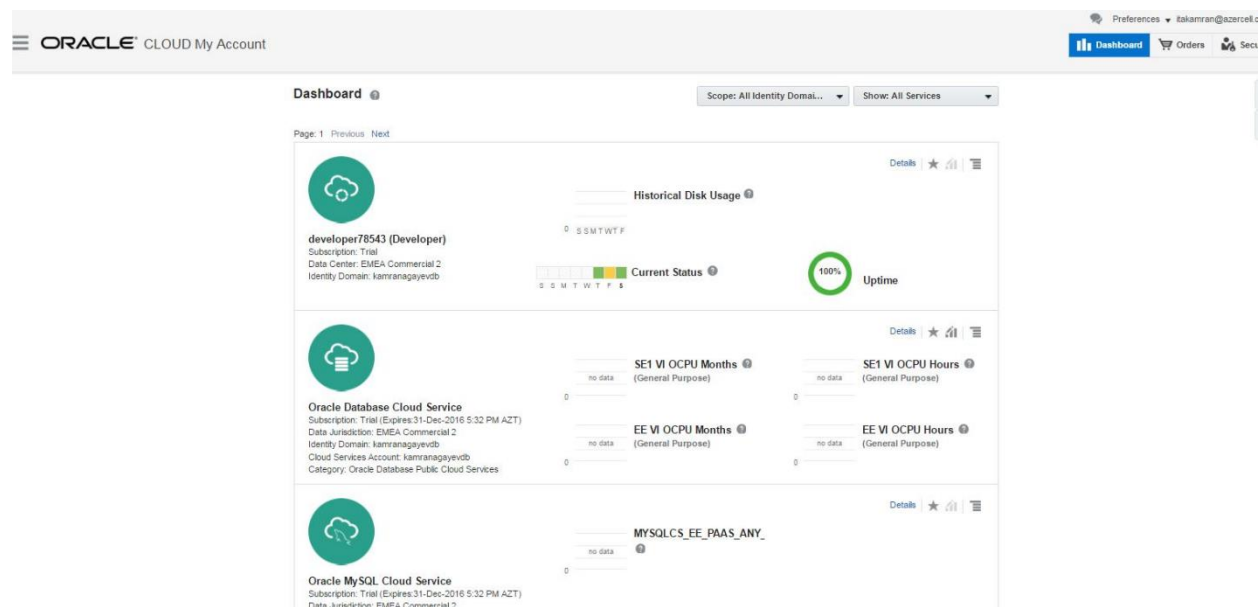
<http://www.ocmguides.com>

Step by step guide to create an Oracle Database in the Cloud


In this blog post I will share the steps to create an Oracle Database in Cloud. We will create a database service, create a second database in the same machine in a silent mode, access to the cloud machine with SSH and monitor the database with OEM.

First of all, make sure you have an Oracle account. Open oracle.com and click on Register link to get a free oracle account. Next, open cloud.oracle.com, select “Compute” from Infrastructure menu and click “Try It” button to get a free trial account for 1 month. Next, login with your oracle account and register for cloud account. Make sure you don’t apply with generic email addresses like hotmail, gmail and etc. Instead, use your company address.

After successfully registering you will get an email with your credential information. Click on the link specified in the email, provide username/password and login to your cloud account. Click Oracle Database Cloud Service link.



Click on the link under “My Service URL” to access list of cloud services you have.

 **Service Details:Oracle Database Cloud Service**

Overview

Billing Metrics

Identity Domain Administration

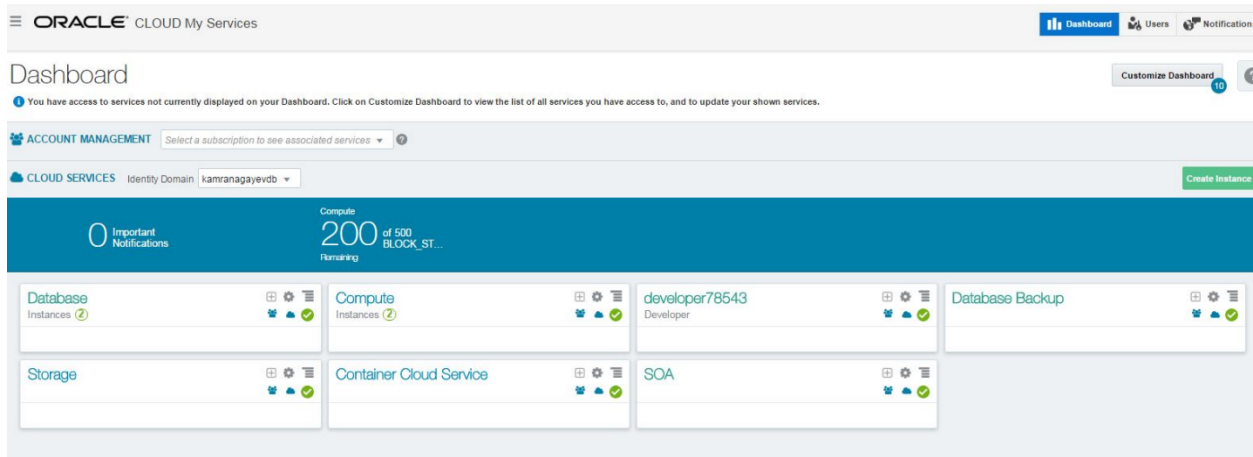
Additional Information

Plan:	Oracle Database Cloud Service	Buyer:	[REDACTED]
Service Start Date:	1-Dec-2016	Account Administrators:	[REDACTED]
Service End Date:	31-Dec-2016	Data Center:	EMEA Commercial 2
Subscription ID:	554043671	Status:	Active
Service Instance ID:	554044968	My Services URL:	https://myservices.emea.ora...
Order ID:	Not available	Domain SFTP Host & Port:	[REDACTED]
Customer Account:	[REDACTED]	Domain SFTP User Name:	[REDACTED]
CSI Number:	Not available	REST Endpoint:	https://dbcs.emea.oracleclo...

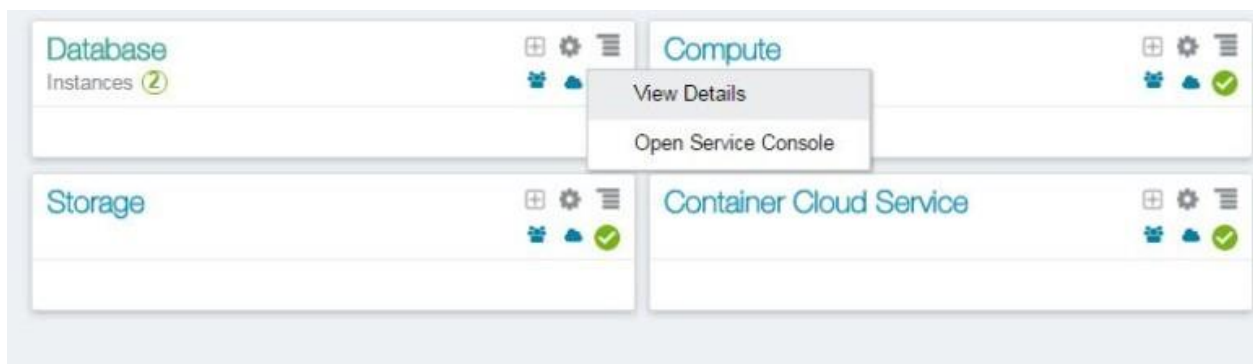
If you haven't signed in yet, sign in page will appear. Use the username and password provided in the email you got during the registration and login



Next, Oracle Cloud Services dashboard will appear.



To create and manage database instances, click on the “Open Service Console” menu of the Database tab as shown below:



In this page you will get list of database services. Here, I have two database services (myfirstdb, myseconddb). I have 7.5G memory and 150gb of storage provided for each service.

ORACLE® CLOUD My Services

Dashboard Users Notifications

Oracle Database Cloud Service

Services Activity SSH Access

Welcome! | REST APIs

Summary





2	2	15 GB	300 GB	2
Services	OCPUs	Memory	Storage	Public IPs

Services

Enter a full or partial service name

As of Dec 3, 2016 9:52:08 AM UTC

Create Service

 <p>myseconddb</p> <p>Version: 11.2.0.4</p> <p>Edition: Enterprise Edition</p>	<p>Created On: Dec 2, 2016 12:04:37 PM UTC</p>	<p>OCPUs: 1</p> <p>Memory: 7.5 GB</p> <p>Storage: 150 GB</p>	
 <p>myfirstdb</p> <p>Version: 11.2.0.4</p> <p>Edition: Enterprise Edition</p>	<p>Created On: Dec 2, 2016 6:55:09 AM UTC</p>	<p>OCPUs: 1</p> <p>Memory: 7.5 GB</p> <p>Storage: 150 GB</p>	

Service create and delete history





Click Delete on the drop down menu for each service and delete both services.

Services

Enter a full or partial service name

As of Dec 3, 2016 9:52:08 AM UTC

Create Service

 <p>myseconddb</p> <p>Version: 11.2.0.4</p> <p>Edition: Enterprise Edition</p>	<p>Created On: Dec 2, 2016 12:04:37 PM UTC</p>	<p>Open DBaaS Monitor Console</p> <p>Open Application Express Console</p> <p>Open EM Console</p> <p>SSH Access</p> <p>Access Rules</p> <p>Delete</p>	
 <p>myfirstdb</p> <p>Version: 11.2.0.4</p> <p>Edition: Enterprise Edition</p>	<p>Created On: Dec 2, 2016 6:55:09 AM UTC</p>		

Service create and delete history

After successfully deleting available instances, click on “Create Service” button to create a new database instance:

services

Create Service


You don't have any services. After meeting the prerequisites, use this button to create a service.

Need help creating a service?

- Watch a video
- Step through a tutorial

► Service create and delete history

Select “Oracle Database Cloud Service” option to create a database using a wizard. For the billing frequency you have two options: Hourly and Monthly. It doesn't make sense when you use a trial account. So select any of them and click Next.


Provision New Oracle Database Cloud Service

Cancel

Subscription
Release
Edition
Details
Confirmation

Next

Subscription Type

Select the service level and billing frequency for this Oracle Database Cloud Service instance.

Service Level

☒
Oracle Database Cloud Service
Oracle Database software pre-installed on Oracle Cloud Virtual Machine.
Database instances are created for you using configuration options provided in this wizard.
Additional cloud tooling is available for backup, recovery and patching.

☐
Oracle Database Cloud Service - Virtual Image
Oracle Database software pre-installed on an Oracle Cloud Virtual Machine.
Database instances are created by you manually or using DBCA.
No additional cloud tooling is available.

Billing Frequency

☐
Hourly
Pay for the number of hours used

☒
Monthly
Pay one low price for the entire month irrespective of the number of hours used

For the software release you have 3 options: 11.2, 12.1 and 12.2. Choose any of them and click Next.

The screenshot shows the 'Provision New Oracle Database Cloud Service' wizard. The 'Release' step is selected in the progress bar. Below the progress bar, the 'Software Release' section is active, with the instruction: 'Select the database release version for this Oracle Database Cloud Service instance.' Three options are listed:

- Oracle Database 11g Release 2**
☒ Oracle Database Version 11.2.0.4
Installed on Oracle Linux 6.6
- Oracle Database 12c Release 1**
☐ Oracle Database Version 12.1.0.2
Installed on Oracle Linux 6.6
- Oracle Database 12c Release 2**
☐ Oracle Database Version 12.2.0.1
Installed on Oracle Linux 6.6

As a software edition, you have 4 options:

Standard Edition

Enterprise Edition

Enterprise Edition – High Performance

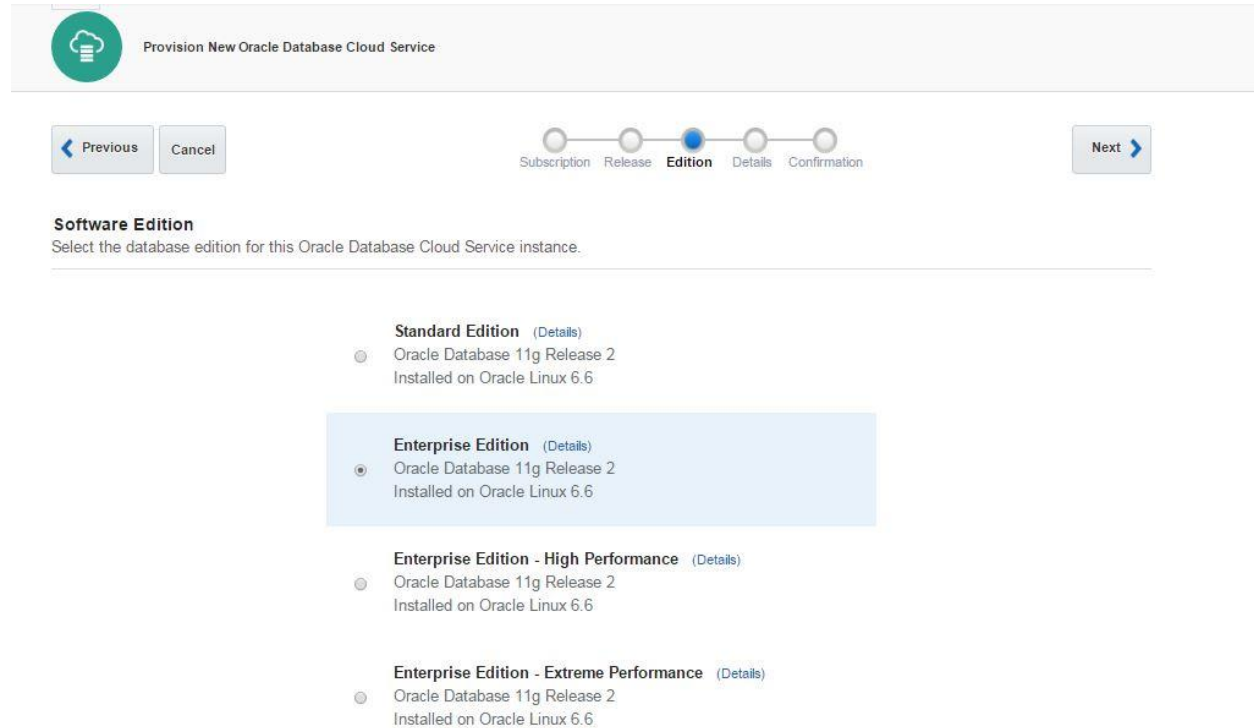
Enterprise Edition – Extreme Performance

To get more information and features that each edition provides, check the following documentation:

Home / Cloud / Oracle Database Cloud Service/ Using Oracle Database Cloud Service/ About Database Cloud Service Database Deployments/ Oracle Database Software Package

https://docs.oracle.com/cloud/latest/dbcs_dbaas/CSDBI/GUID-660363B8-0E2F-4A4F-A9BD-70A43F332A16.htm#GUID-6C0B1E17-98A5-4522-A3B9-36EFA05E64F9

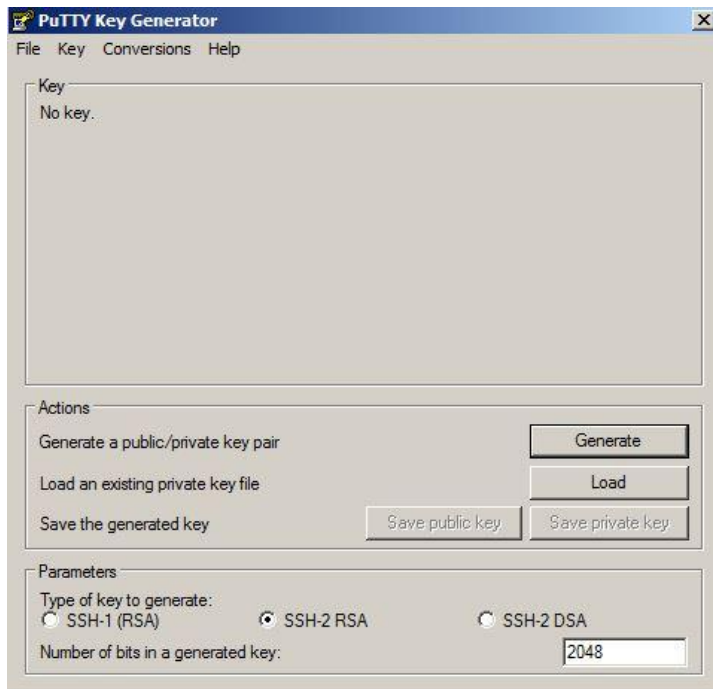
Select “Enterprise Edition” option and click Next



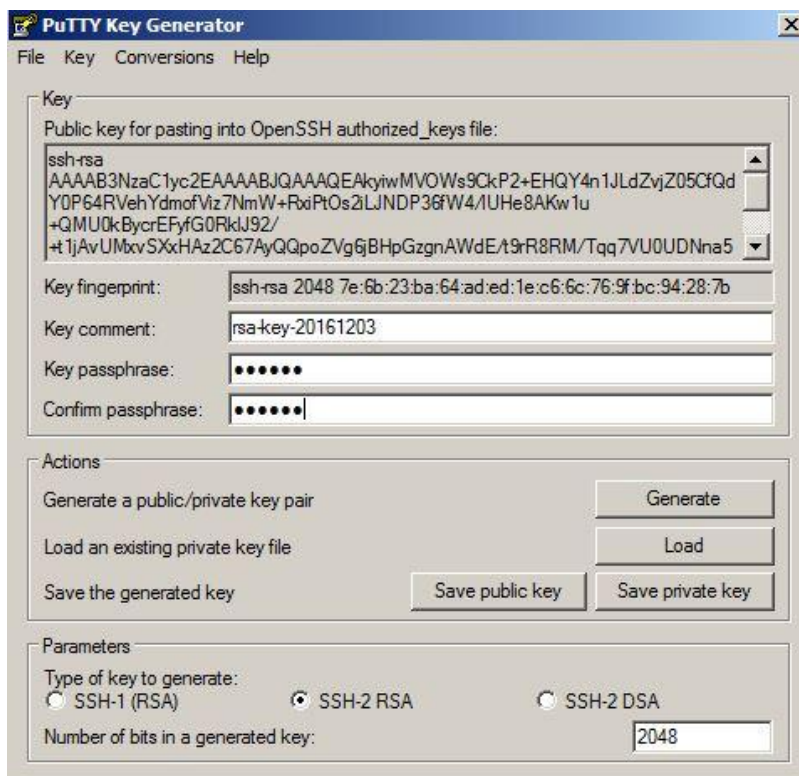
The screenshot shows the 'Provision New Oracle Database Cloud Service' wizard. At the top, there's a header with the Oracle logo and the title. Below the header, there's a progress bar with five steps: Subscription, Release, Edition, Details, and Confirmation. The 'Edition' step is currently selected and highlighted. To the left of the progress bar are 'Previous' and 'Cancel' buttons, and to the right is a 'Next' button. Below the progress bar, the section is titled 'Software Edition' with the instruction 'Select the database edition for this Oracle Database Cloud Service instance.' There are four options listed, each with a radio button and a '(Details)' link:

- Standard Edition** (Details)
☐ Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- Enterprise Edition** (Details)
☒ Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- Enterprise Edition - High Performance** (Details)
☐ Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- Enterprise Edition - Extreme Performance** (Details)
☐ Oracle Database 11g Release 2
Installed on Oracle Linux 6.6

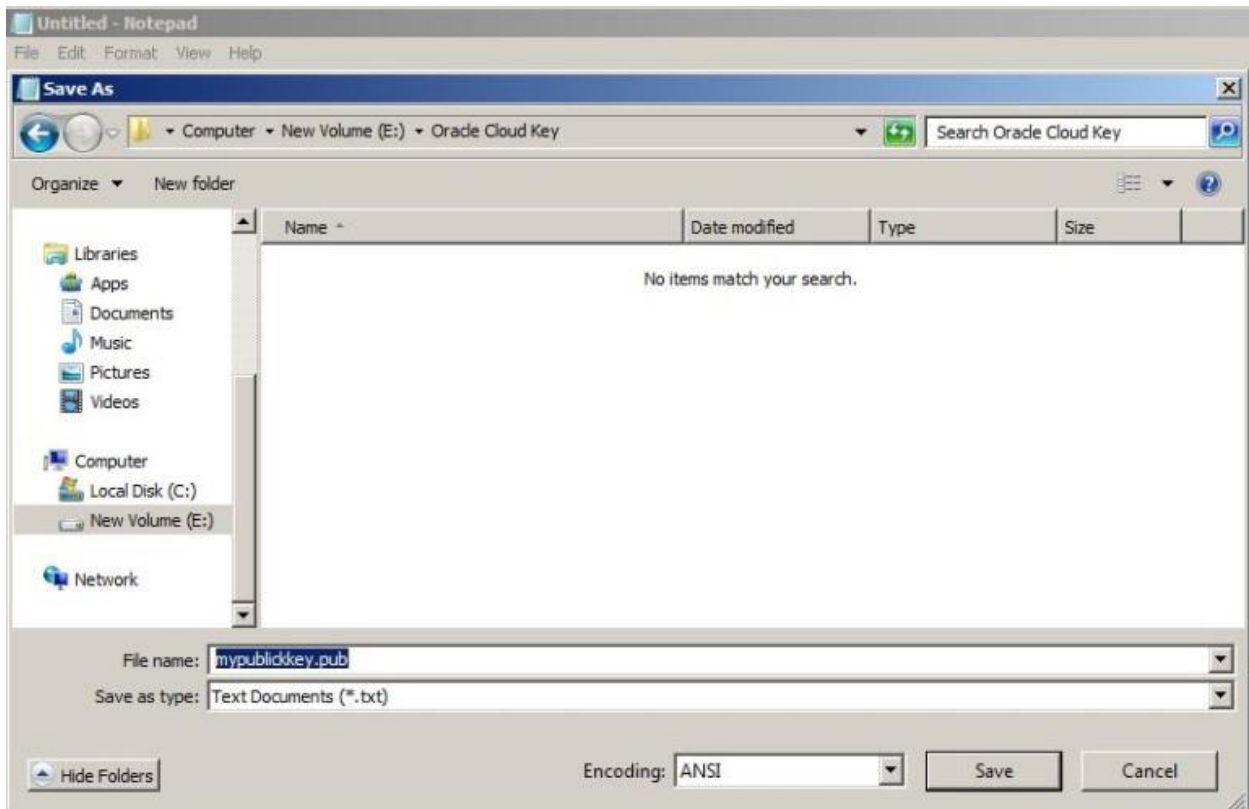
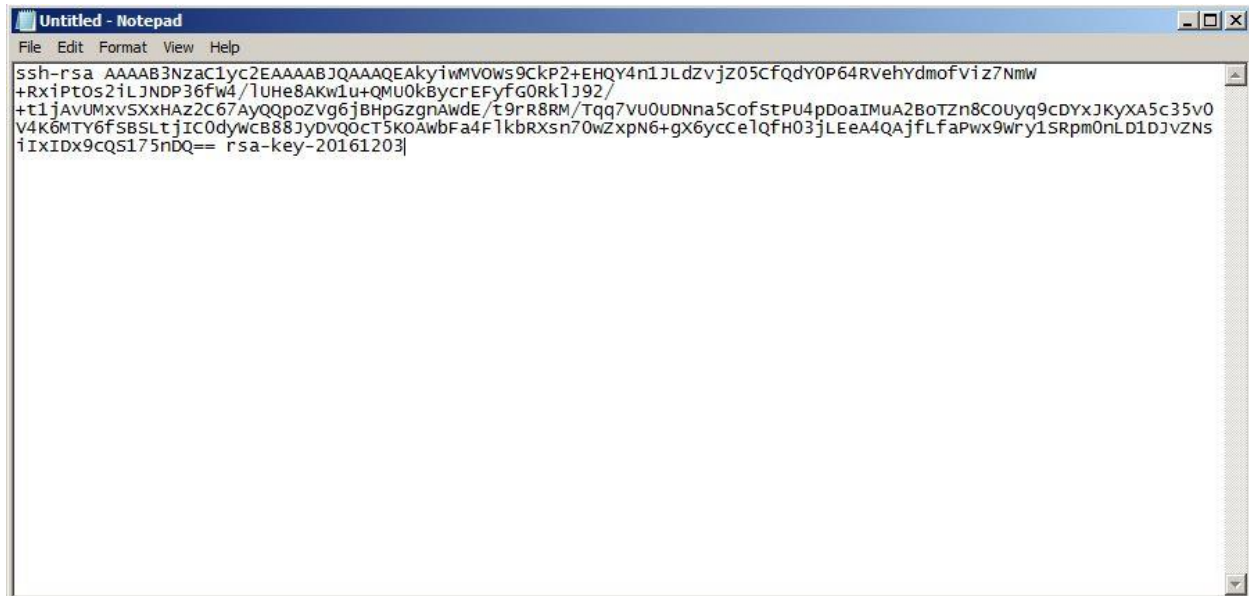
In the next page you will be asked to provide a SSH Public Key for the cloud service. For this, use Putty Key Generator executable to generate a SSH public key. Click on Generate button, move your mouse over the blank area to generate some action.



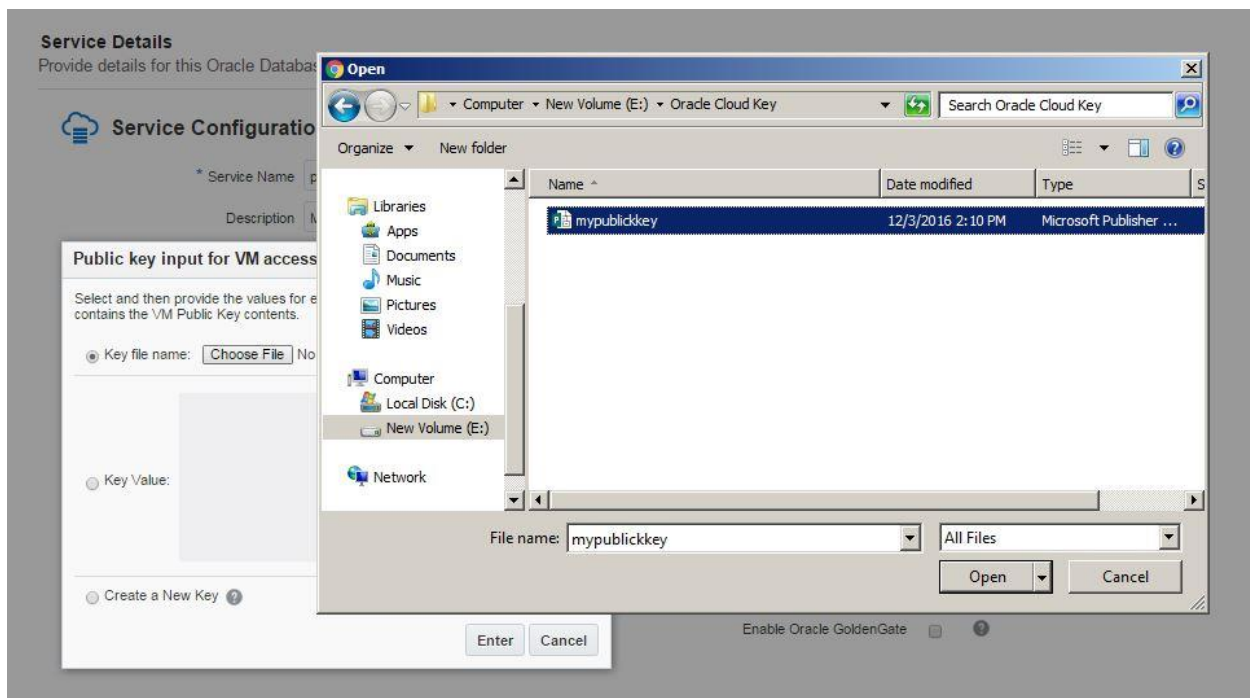
The SSH key will be generated as follows. Provide a password and click on “Save private key” button to save this key as a private key



To save a key as a public key, copy the text and save it.



Provide this file for the “SSH Public Key” field of the database service creation wizard.



Provide the service name, database storage, select necessary compute shape and click Next.



Provision New Oracle Database Cloud Service

[Previous](#) [Cancel](#)

Subscription Release Edition **Details** Confirmation

[Next](#)

Service Details

Provide details for this Oracle Database Cloud Service instance.



Service Configuration

* Service Name ?
Description ?
* Compute Shape
* Timezone
* SSH Public Key [Edit](#) ?



Backup and Recovery Configuration

* Backup Destination ?
Total Estimated Monthly Storage (GB) ?



Database Configuration

* Usable Database Storage (GB)
Total Data File Storage (GB)
* Administration Password ?
* Confirm Password ?
* DB Name (SID) ?

* Create Instance from Existing Backup
* Character Set
* National Character Set
Standby Database with Data Guard ☐ ?
Enable Oracle GoldenGate ☐ ?

Review the information and click Create button to create a service



Provision New Oracle Database Cloud Service

[< Previous](#) [Cancel](#)



[Create >](#)

Confirmation

Confirm your responses and create this Oracle Database Cloud Service instance.




Service Level: Oracle Database Cloud Service
Billing Frequency: Monthly
Software Release: Oracle Database 11g Release 2
Software Edition: Enterprise Edition
Service Name: proddb
Description: My first cloud db
Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM
Timezone: (UTC) Coordinated Universal Time(UTC)
Key: mypublickey.pub
Usable Database Storage: 25
Total Data File Storage: 88.5
DB Name (SID): PRODDB
Character Set: AL32UTF8 - Unicode Universal character set UTF-8 form 32-bit
National Character Set: AL16UTF16 - Unicode UTF-16 Universal character set
Standby Database with Data Guard: No
Disaster Recovery: No
Include GoldenGate: No



Backup Destination: None

Click "In Progress" link to check the service creation progress.


Oracle Database Cloud Service

[Services](#)
[Activity](#)
[SSH Access](#)

Welcome! | [REST APIs](#)

Summary

1

1

7.5 GB

150 GB

1

Services

OCPUs


Memory

Storage

Public IPs

Services

As of Dec 3, 2016 10:20:44 AM UTC [Create Service](#)



proddb
 Status: In Progress
 Version: 11.2.0.4
 Edition: Enterprise Edition


Starting Compute resources...

Submitted On: Dec 3, 2016 10:12:57 AM UTC

OCPUs: 1
 Memory: 7.5 GB
 Storage: 150 GB

▶ Service create and delete history

After a while, the service will be created successfully.


Oracle Database Cloud Service

[Services](#)
[Activity](#)
[SSH Access](#)

Welcome! | [REST APIs](#)

Summary

1

1

7.5 GB

150 GB

1

Services

OCPUs


Memory

Storage

Public IPs

Services

As of Dec 3, 2016 11:07:49 AM UTC [Create Service](#)




proddb
 Version: 11.2.0.4
 Edition: Enterprise Edition

Created On: Dec 3, 2016 10:12:57 AM UTC

OCPUs: 1
 Memory: 7.5 GB
 Storage: 150 GB

▶ Service create and delete history

Click on proddb link to open the service.


Oracle Database Cloud Service / proddb

Overview

1 Node

Administration

0 Patches available

0 Snapshots available

Summary

1 Nodes

1 OCPUs

7.5 GB Memory

150 GB Storage

Nodes

As of Dec 3, 2016 11:08:25 AM UTC

proddb

Public IP: 141.144.32.70

SQL *Net Port: 1521

SID: PRODDb

OCPUs: 1

Memory: 7.5 GB

Storage: 150 GB

Additional Information

Identity Domain:

kamranagayevdb

Edition:

Enterprise Edition

Service Level:

Oracle Database Cloud Service

Subscription Type:

Monthly

show more

Activity

Activity Summary

✓

Create Service Completed

Start Time: Dec 3, 2016 10:12:57 AM UTC

End Time: Dec 3, 2016 10:34:06 AM UTC

Before trying to connect to the database in the cloud from outside, you should enable dblistener security rule. Open “Oracle Database Cloud Service” dashboard.

Oracle Cloud Services

Dashboard

Oracle Application Container Cloud

Oracle Compute Cloud Service

Oracle Database Cloud Service

Oracle Java Cloud Service

Oracle MySQL Cloud Service

Oracle SOA Cloud Service

Users

Notifications

ORACLE[®] CLOUD My Services

Oracle Database Cloud Service / proddb

Overview

1 Node

Administration

0 Patches available

0 Snapshots available

Summary

1 Nodes

1 OCPUs

Nodes

proddb

Public IP: 141.144.32.70

Additional Information

Identity Domain: kam

Edition: Ente

Service Level: Ora

Subscription Type: Mor

show more

Click on Network tab

ORACLE[®] CLOUD My Services

Compute

Instances

Network

Storage

Orchestrations

Images

Instances

Instance Snapshots

Summary

1 instances

1 OCPUs

Instances

An Oracle Compute Cloud Service instance is a virtual machine running a specific operating syst

Category: All

Show: All

Name	Status	OCPUs
proddb/db_1/vm-1	Running	1

When you click on Network tab, you will get list of security roles.

ORACLE[®] CLOUD My Services

Compute

Instances

Network

Storage

Orchestrations

Images

Security

Security Rules

Security Lists

Security Applications

Security IP Lists

IP Network

IP Reservations

SSH Public Keys

VPN

Summary










9 security rules

Security Rules











You can use security rules to control network access between your instances and the Internet. On this page, you can create, view, update, a

Category: All

Show: All

Name	Status	Security Application
 proddb/db_1/ora_p2_dbconsole	Disabled	proddb/db_1/ora_dbconsole
 proddb/db_1/ora_p2_dbexpress	Disabled	proddb/db_1/ora_dbexpress
 proddb/db_1/ora_p2_dblistener	Disabled	proddb/db_1/ora_dblistener
 proddb/db_1/ora_p2_http	Disabled	proddb/db_1/ora_http
 proddb/db_1/ora_p2_httpadmin	Disabled	proddb/db_1/ora_httpadmin
 proddb/db_1/ora_p2_https	Disabled	proddb/db_1/ora_https
 proddb/db_1/ora_p2_ssh	Enabled	ssh
 proddb/db_1/ora_trusted_hosts_dblistener	Enabled	proddb/db_1/ora_dblistener
 proddb/db_1/sys_infra2db_ssh	Enabled	ssh

Click on the menu icon for ora_p2_dblistener role and select Update.

Name	Status	Security Application	Source	Destination	
 proddb/db_1/ora_p2_dbconsole	Disabled	proddb/db_1/ora_dbconsole	public-internet	proddb/db_1/ora_db	
 proddb/db_1/ora_p2_dbexpress	Disabled	proddb/db_1/ora_dbexpress	public-internet	proddb/db_1/ora_db	
 proddb/db_1/ora_p2_dblistener	Disabled	proddb/db_1/ora_dblistener	public-internet	proddb/db_1/ora_db	
 proddb/db_1/ora_p2_http	Disabled	proddb/db_1/ora_http	public-internet	proddb/db_1/ora_db	
 proddb/db_1/ora_p2_https	Disabled	proddb/db_1/ora_https	public-internet	proddb/db_1/ora_db	

Update

Delete

Enable the status of this security role

17

Update Security Rule

?

*

Name

proddb/db_1/ora_p2_dblistener

Status

Enabled

Security Application

proddb/db_1/ora_dblistener

Source

Security List

default

Security IP List

public-internet

Destination

Security List

proddb/db_1/ora_db

Security IP List

instance

Description

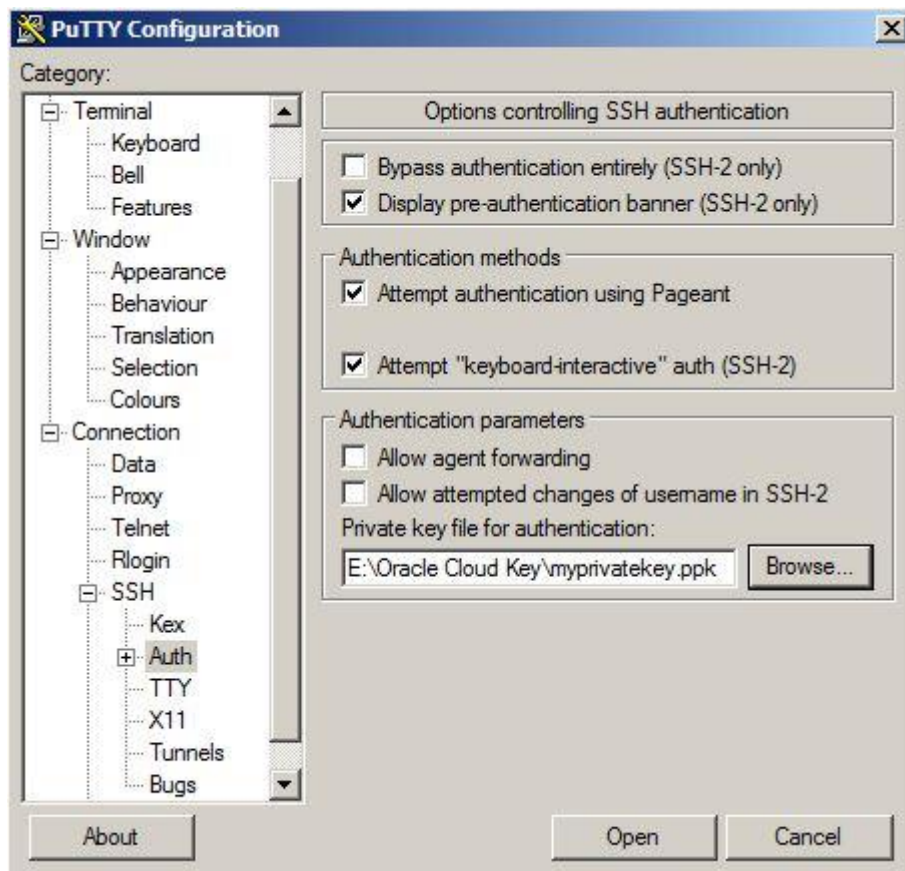
Update

Cancel

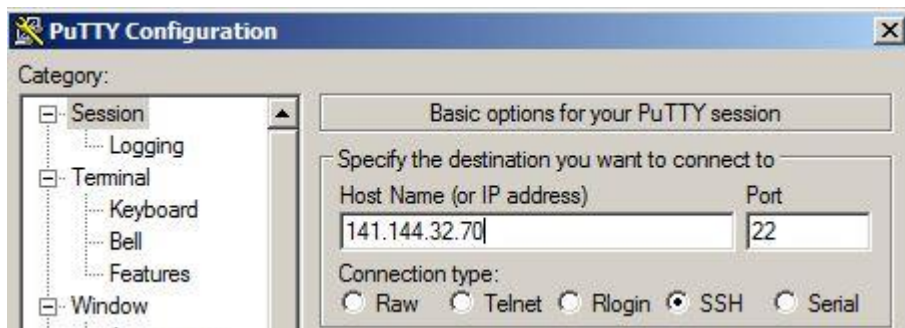
Enable the ora_p2_dbconsole security role to get access to OEM.

	Name	Status
	proddb/db_1/ora_p2_dbconsole	Enabled
	proddb/db_1/ora_p2_dbexpress	Disabled
	proddb/db_1/ora_p2_dblistener	Enabled

Now, let's connect to the database from SSH. Provide the private key that was saved above



Provide the IP of the virtual machine that is provided in the main page of the database cloud service and click Open.



Provide username as "oracle" and password that was provided when generating a private key using PuTTY Key Generator tool and login to the server where the database is running. Connect to SQL*Plus and run SQL commands:

```
oracle@proddb:~  
login as: oracle  
Authenticating with public key "rsa-key-20161203"  
Passphrase for key "rsa-key-20161203":  
[oracle@proddb ~]$ df -kh  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/xvdb3      25G   12G   12G   50% /  
tmpfs           3.6G    0   3.6G    0% /dev/shm  
/dev/xvdb1      477M  148M  300M   34% /boot  
/dev/xvde1      59G   7.4G   49G   14% /u01  
/dev/mapper/dataVolGroup-lvol0  
                25G   2.2G   22G   10% /u02  
/dev/mapper/fraVolGroup-lvol0  
                6.8G   2.1G   4.4G   32% /u03  
/dev/mapper/redoVolGroup-lvol0  
                26G   3.1G   22G   13% /u04  
[oracle@proddb ~]$
```

```
oracle@proddb:~  
[oracle@proddb ~]$ sqlplus / as sysdba  
  
SQL*Plus: Release 11.2.0.4.0 Production on Sat Dec 3 11:18:39 2016  
  
Copyright (c) 1982, 2013, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing options  
  
SQL> select * from v$version;  
  
BANNER  
-----  
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  
PL/SQL Release 11.2.0.4.0 - Production  
CORE      11.2.0.4.0      Production  
TNS for Linux: Version 11.2.0.4.0 - Production  
NLSRTL Version 11.2.0.4.0 - Production  
  
SQL>  
SQL>  
SQL>
```

No open tnsnames.ora file and add the following entry:

```
tnsnames.ora
PRODDB =
(DESCRIPTION =
  (ADDRESS = (PROTOCOL = TCP) (HOST = 141.144.32.70) (PORT = 1521))
  (CONNECT_DATA =
    (SID = PRODDB)
  )
)
```

Open a command prompt, login to the database in the cloud and run SQL commands:

```
C:\Windows\system32\CMD.exe - sqlplus sys@PRODDB as sysdba
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\itakamran>sqlplus sys@PRODDB as sysdba

SQL*Plus: Release 11.2.0.1.0 Production on Sat Dec 3 15:20:52 2016

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter password:

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> select name from v$datafile;

NAME
-----
/u02/app/oracle/oradata/PRODDB/system01.dbf
/u02/app/oracle/oradata/PRODDB/sysaux01.dbf
/u02/app/oracle/oradata/PRODDB/undotbs01.dbf
/u02/app/oracle/oradata/PRODDB/users01.dbf
/u02/app/oracle/oradata/PRODDB/example01.dbf

SQL> select name from v$controlfile;

NAME
-----
/u02/app/oracle/oradata/PRODDB/control01.ctl
/u03/app/oracle/fast_recovery_area/PRODDB/control02.ctl

SQL> select member from v$logfile;

MEMBER
-----
/u04/app/oracle/redo/redo03.log
/u04/app/oracle/redo/redo02.log
/u04/app/oracle/redo/redo01.log

SQL>
```

To open an OEM, click on the menu icon on the Database Cloud Service home page and select “Open EM Console”

Oracle Database Cloud Service / proddb

- Open DBaaS Monitor Console
- Open Application Express Console
- Open EM Console
- SSH Access
- Access Rules
- Replace Database using Backup

Overview

1 Node

Administration

0 Patches available

0 Snapshots available

Summary

1 Nodes

Nodes

proddb
Public IP: 141.144.32.70

SQL *Net Port: 1521
SID: PRODDb

OCPU: 1
Memory: 7.5 GB
Storage: 150 GB

As of Dec 3, 2016 11:17:04 AM UTC

Additional Information

Provide the username and password and login

Oracle Enterprise Manager

https://141.144.32.70:1158/em/console/login/login

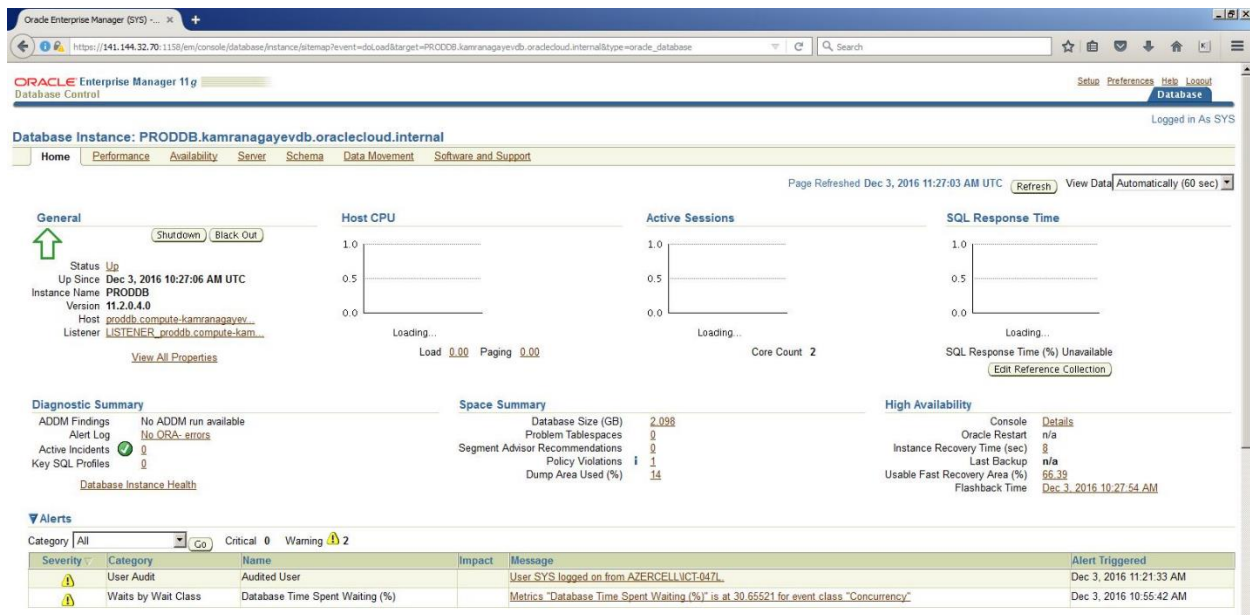
ORACLE Enterprise Manager 11g Database Control

Login

* User Name: sys
 * Password:
 Connect As: SYSDBA

Login

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 Unauthorized access is strictly prohibited.



Oracle Enterprise Manager 11g Database Control

Database Instance: PRODDB.kamranagayevdb.oraclecloud.internal

Tablespaces

Search

Enter an object name to filter the data that is displayed in your results set.

Object Name Go

By default, the search returns all uppercase matches beginning with the string you entered. To run an exact or case-sensitive match, double quote the search string. You can use the wildcard symbol (%) in a double quote.

Selection Mode Single

Select	Name	Allocated Size(MB)	Space Used(MB)	Allocated Space Used(%)	Auto Extend	Allocated Free Space(MB)	Status
<input checked="" type="radio"/>	EXAMPLE	313.1	310.2	99.1	YES	2.9	Online
<input type="radio"/>	SYS_AUX	670.0	632.4	94.4	YES	37.6	Online
<input type="radio"/>	SYSTEM	780.0	777.9	99.7	YES	2.1	Online
<input type="radio"/>	TEMP	55.0	1.0	1.8	YES	54.0	Online
<input type="radio"/>	UNDOTBS1	335.0	15.2	4.6	YES	319.8	Online
<input type="radio"/>	USERS	5.0	4.1	81.2	YES	0.9	Online

Total Allocated Size (GB) 2.11

Total Used (GB) 1.70

Total Allocated Free Space (GB) 0.41

After creating and configuring a database using a wizard, I decided to create a new database in a silent mode in the same machine as follows:


```
[oracle@proddb dbhome_1]$ dbca -silent -createdatabase -gdbname mydb -  
templatename  
/u01/app/oracle/product/11.2.0/dbhome_1/assistants/dbca/templates/General_Purpose.dbc -sid mydb -syspassword oracle -systempassword oracle -  
emConfiguration none -datafileDestination /u02/app/oracle/oradata/mydb  
-memoryPercentage 40
```

Copying database files

1% complete

3% complete

11% complete

18% complete

26% complete

37% complete

Creating and starting Oracle instance

40% complete

45% complete

50% complete

55% complete

56% complete

60% complete

62% complete

Completing Database Creation

66% complete

70% complete

73% complete

74% complete

75% complete

76% complete

77% complete

88% complete

99% complete

100% complete

Look at the log file `"/u01/app/oracle/cfgtoollogs/dbca/mydb/mydb.log"` for further details.

```
[oracle@proddb dbhome_1]$
```

Check if the database is up and running and connect to it:

```
[oracle@proddb dbhome_1]$ ps -ef | grep smon
oracle      7040      1  0 11:40 ?          00:00:00 ora_smon_mydb
oracle      7226    2625  0 11:40 pts/1      00:00:00 grep smon
oracle     11837      1  0 10:30 ?          00:00:00 ora_smon_PRODDb

[oracle@proddb dbhome_1]$ export ORACLE_SID=mydb
[oracle@proddb dbhome_1]$ sqlplus / as sysdba
SQL>
```

Run free command to check the free space of the machine. We have 2 databases running on this machine, so we have only 1g free memory.

```
[oracle@proddb dbhome_1]$ free
total        used        free      shared    buffers     cached
Mem:      7397060    6295684    1101376      266948     66356     1364664
-/+ buffers/cache:    4864664    2532396
Swap:      4194300      29916    4164384

[oracle@proddb dbhome_1]$
```

After having a database service with the specific parameters, you can change the parameters anytime. Let's add 2gb free space to the machine. Switch to the home page of the database cloud service, click on the menu icon and choose "Scale Up/Down" link

Summary

1	1	7.5 GB	150 GB
Nodes	OCPUs	Memory	Storage

Nodes As of Dec 3, 2016 12:04:48 PM UTC

proddb
Public IP: 141.144.32.70
SQL *Net Port: 1521
SID: PRODDB

OCPUs: Start
Memory: Stop
Storage: Restart
Scale Up/Down

Additional Information

Identity Domain:	kamranagayevdb
Edition:	Enterprise Edition
Service Level:	Oracle Database Cloud Service
Subscription Type:	Monthly

[show more](#)

Activity

Provide size of the new space and click “Yes, Scale Up/Down Service” button

Scale Up/Down Service

proddb is currently using compute shape OC3. Specify new shape and/or additional storage for the service.
Note that the service will be unavailable during scale up/down operation.

New Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM

Additional Storage (GB): 2

Add Storage to: Create New Storage Volume

Yes, Scale Up/Down Service Cancel

The host will reboot and the required space will be added :

Summary

1

Nodes

1

OCPUs

7.5

GB

Memory

152

GB

Storage

▲ Nodes

As of Dec 5, 2016 5:14:19 AM UTC

proddb
Public IP: 141.144.32.70

SQL *Net Port: 1521

SID: PRODDb

OCPUs: 1

Memory: 7.5 GB

Storage: 152 GB

The new space is mounted to the new mount point (u05):

```
[oracle@proddb ~]$ df -kh
Filesystem                Size      Used Avail Use% Mounted on
/dev/xvdb3                 25G       12G   12G   51% /
tmpfs                     3.6G         0   3.6G    0% /dev/shm
/dev/xvdb1                 477M      148M   300M   34% /boot
/dev/xvde1                 59G       7.4G   49G   14% /u01
/dev/mapper/dataVolGroup-lvol0
25G   3.8G   20G   17% /u02
/dev/mapper/fraVolGroup-lvol0
6.8G   2.1G   4.4G   32% /u03
/dev/mapper/redoVolGroup-lvol0
26G   3.1G   22G   13% /u04
/dev/xvdg1                 2.0G     3.1M   1.9G    1% /u05
[oracle@proddb ~]$
```

Step by step guide – create a primary and standby database in the Cloud!

In this guide, I will show you how to create a primary and standby database in the cloud. Login to your cloud account, switch to the Oracle Database Cloud Service page and create a new service. Select “Oracle Database Cloud Service” as a subscription type and click Next.

The screenshot shows the first step of a five-step wizard to create an Oracle Database Cloud Service instance. The steps are: Subscription, Release, Edition, Details, and Confirmation. The 'Subscription' step is currently active, indicated by a blue dot and a highlighted yellow background. At the top left is a 'Cancel' button, and at the top right is a 'Next' button with a blue arrow. Below the step indicators, the text 'Subscription Type' is followed by the instruction: 'Select the service level and billing frequency for this Oracle Database Cloud Service instance.' The main content area is divided into two sections. The first section, 'Service Level', contains two radio button options. The first option, 'Oracle Database Cloud Service', is selected and highlighted with a light blue background; its description states that Oracle Database software is pre-installed on an Oracle Cloud Virtual Machine, instances are created using wizard options, and additional cloud tooling is available for backup, recovery, and patching. The second option, 'Oracle Database Cloud Service - Virtual Image', is unselected and describes software pre-installed on a VM where instances are created manually or via DBCA, with no additional cloud tooling. The second section, 'Billing Frequency', also has two radio button options. The 'Hourly' option is unselected, describing payment for the number of hours used. The 'Monthly' option is selected and highlighted with a light blue background, describing payment of a low price for the entire month regardless of hours used.

Cancel

Subscription Release Edition Details Confirmation

Next >

Subscription Type
Select the service level and billing frequency for this Oracle Database Cloud Service instance.

Service Level

☒ **Oracle Database Cloud Service**
Oracle Database software pre-installed on Oracle Cloud Virtual Machine.
Database instances are created for you using configuration options provided in this wizard.
Additional cloud tooling is available for backup, recovery and patching.

☐ **Oracle Database Cloud Service - Virtual Image**
Oracle Database software pre-installed on an Oracle Cloud Virtual Machine.
Database instances are created by you manually or using DBCA.
No additional cloud tooling is available.

Billing Frequency

☐ **Hourly**
Pay for the number of hours used

☒ **Monthly**
Pay one low price for the entire month irrespective of the number of hours used

Select a database release and click Next.



Software Release

Select the database release version for this Oracle Database Cloud Service instance.

- ☒ **Oracle Database 11g Release 2**
Oracle Database Version 11.2.0.4
Installed on Oracle Linux 6.6
- ☐ **Oracle Database 12c Release 1**
Oracle Database Version 12.1.0.2
Installed on Oracle Linux 6.6
- ☐ **Oracle Database 12c Release 2**
Oracle Database Version 12.2.0.1
Installed on Oracle Linux 6.6

Select “Enterprise Edition – Extreme Performance” as a Software Edition and click Next



Software Edition

Select the database edition for this Oracle Database Cloud Service instance.

- ☐ **Standard Edition** [\(Details\)](#)
Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- ☐ **Enterprise Edition** [\(Details\)](#)
Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- ☐ **Enterprise Edition - High Performance** [\(Details\)](#)
Oracle Database 11g Release 2
Installed on Oracle Linux 6.6
- ☒ **Enterprise Edition - Extreme Performance** [\(Details\)](#)
Oracle Database 11g Release 2
Installed on Oracle Linux 6.6

Provide the service name, SSH public key and select “Standby Database with Data Guard” option, select “High Availability” and click Next

Service Details

Provide details for this Oracle Database Cloud Service instance.



Service Configuration

* Service Name

srvdg

?

Description

Data Guard Service

?

* Compute Shape

OC3 - 1 OCPU, 7.5 GB RAM

▼

* Timezone

(UTC+04:00) Azerbaijan Time

▼

* SSH Public Key

mypublickey.pub

Edit

?



Backup and Recovery Configuration

* Backup Destination

None

▼

Total Estimated Monthly Storage (GB)

N/A

?



Database Configuration

* Usable Database Storage (GB)

25

Total Data File Storage (GB)

88.5

* Administration Password

?

* Confirm Password

?

* DB Name (SID)

PRODDb

?

* Character Set

AL32UTF8 - Unicode Un

▼

* National Character Set

AL16UTF16 - Unicode U

▼

Standby Database with Data Guard

☒

?

High Availability

☒

Disaster Recovery

☐

Review the configuration settings and click Create to create a primary and a standby database

Previous

Cancel

Subscription

Release

Edition

Details

Confirmation

Create

Confirmation

Confirm your responses and create this Oracle Database Cloud Service instance.

Service Level: Oracle Database Cloud Service

Billing Frequency: Monthly

Software Release: Oracle Database 11g Release 2

Software Edition: Enterprise Edition - Extreme Performance

Service Name: srvdg

Description: Data Guard Service

Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM

Timezone: (UTC+04:00) Azerbaijan Time(Asia/Baku)

Key: mypublickey.pub

Usable Database Storage: 25

Total Data File Storage: 88.5

DB Name (SID): PRODDb

Character Set: AL32UTF8 - Unicode Universal character set UTF-8 form 32-bit

National Character Set: AL16UTF16 - Unicode UTF-16 Universal character set

Standby Database with Data Guard: Yes

Disaster Recovery: No

Include GoldenGate: No

Database Clustering with RAC: No

Backup Destination: None

After a few minutes the primary and standby database will be created successfully

Summary

1

2

15 GB

374 GB

2

Services

OCPUs

Memory

Storage

Public IPs

Services

Enter a full or partial service name

As of Dec 6, 2016 11:54:28 AM UTC

Create Service

srvdg

Version: 11.2.0.4

Edition: Enterprise Edition - Extreme Performance

Created On: Dec 6, 2016 11:02:17 AM UTC

OCPUs: 2

Memory: 15 GB

Storage: 374 GB

Service create and delete history

Click on the service name (srvdg) to open the home page of both databases

32

Overview

2
Nodes

Administration

View Patch Information

Summary

2
Nodes

2
OCPUs

15 GB
Memory

374 GB
Storage

Nodes

As of Dec 6, 2016 12:01:03 PM UTC

<div>srvdg-dg01</div> <div>Public IP: 141.144.35.190</div> <div>Database Role: Primary</div>	<div>SQL *Net Port: 1521</div> <div>SID: PRODDb</div>	<div>OCPUs: 1</div> <div>Memory: 7.5 GB</div> <div>Storage: 187 GB</div>
<div>srvdg-dg02</div> <div>Public IP: 141.144.36.24</div> <div>Database Role: Standby</div>	<div>SQL *Net Port: 1521</div> <div>SID: PRODDb</div>	<div>OCPUs: 1</div> <div>Memory: 7.5 GB</div> <div>Storage: 187 GB</div>

Additional Information

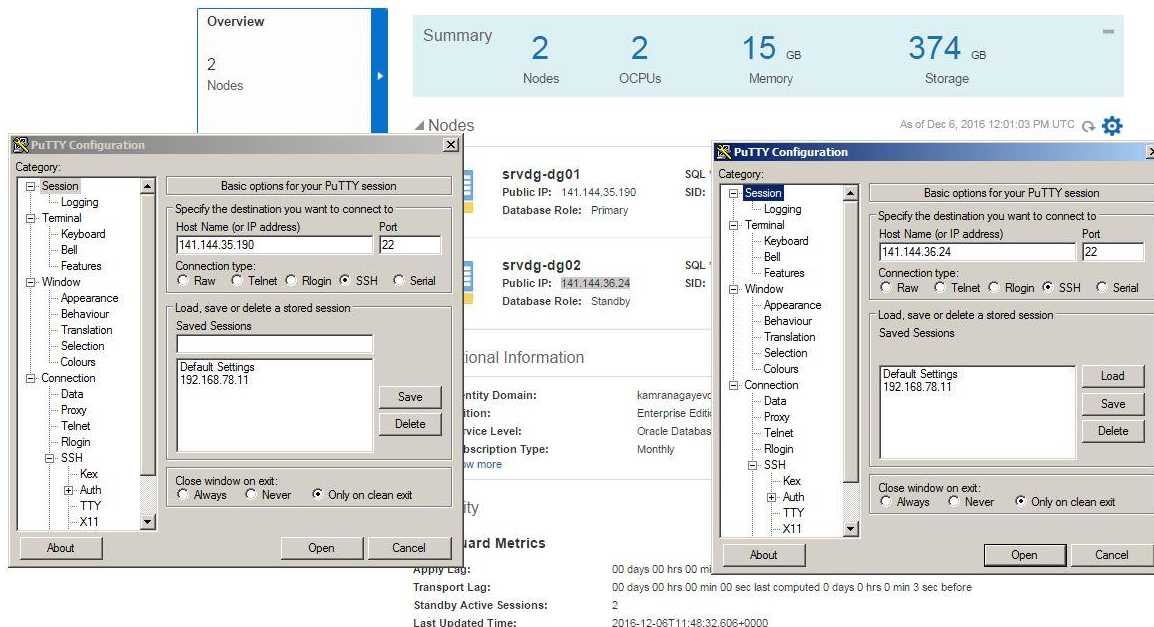
Identity Domain:	kamranagayevdb
Edition:	Enterprise Edition - Extreme Performance
Service Level:	Oracle Database Cloud Service
Subscription Type:	Monthly

Activity

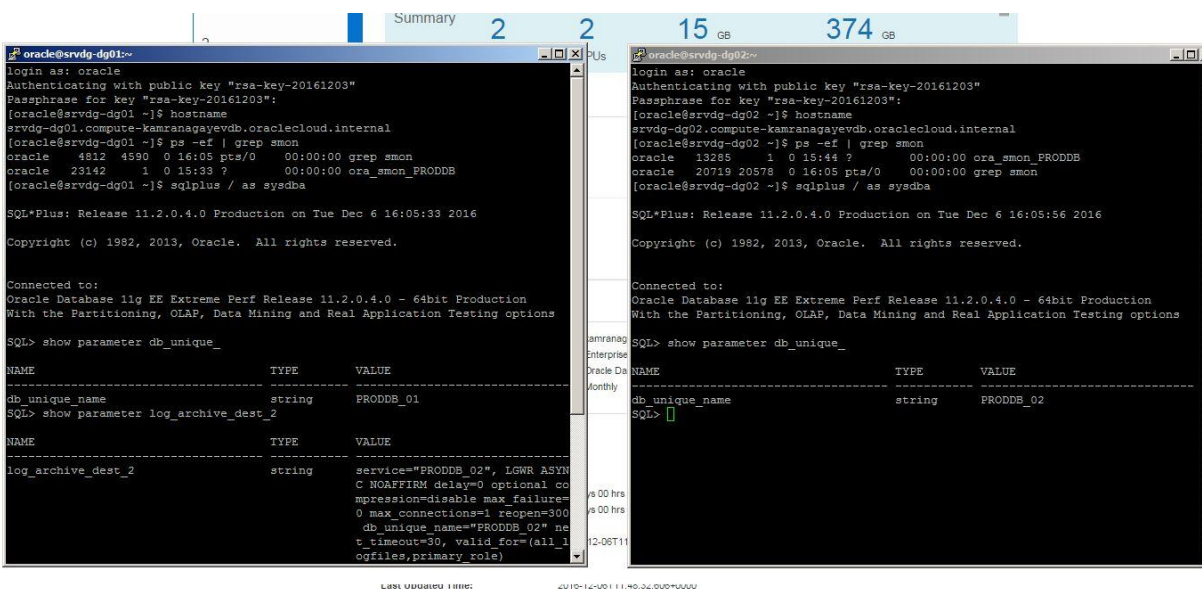
Data Guard Metrics

Apply Lag:	00 days 00 hrs 00 min 00 sec
Transport Lag:	00 days 00 hrs 00 min 00 sec last computed 0 days 0 hrs 0 min 3 sec before
Standby Active Sessions:	2
Last Updated Time:	2016-12-06T11:48:32.606+0000

Now open two different Putty executables and connect to the both machines



Connect to the both databases and check the DB_UNIQUE_NAME parameter. PRODDB_01 is set to the primary database, PRODDB_02 for the standby database. Also check LOG_ARCHIVE_DEST_2 parameter on the primary database. As you see, archived log files are shipped to the standby database using PRODDB_02 service.



Now let's test the functionality of the standby database. First of all, open an alert.log file of the standby database, switch the log file on the primary database and check if the log file is applied

```

[oracle@srvdg-dg01 ~]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 6 16:18:02 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g EE Extreme Perf Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> alter system switch logfile;

System altered.

SQL>

```

```

[oracle@srvdg-dg02 ~]$ cd /u01/app/oracle/diag/rdbms/proddb_02/PRODDb/trace/
[oracle@srvdg-dg02 trace]$ tail -f alert_PRODDb.log

Tue Dec 06 15:45:45 2016
Managed Standby Recovery starting Real Time Apply
Parallel Media Recovery started with 2 slaves
Waiting for all non-current ORLs to be archived...
All non-current ORLs have been archived.
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_02/archivelog/2016_12_06/c1_mf_1_16_d4f971yf_.arc
Media Recovery Waiting for thread 1 sequence 17 (in transit)
Recovery of Online Redo Log: Thread 1 Group 5 Seq 17 Reading mem 0
  Mem# 0: /u04/app/oracle/redo/standby_redo02.log
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER DISCONNECT USING CURRENT LOGFILE

Tue Dec 06 16:18:12 2016
E Archived Log entry 16 added for thread 1 sequence 17 ID 0x2eedd87 dest 1:
C Tue Dec 06 16:18:12 2016
Media Recovery Waiting for thread 1 sequence 18
N Tue Dec 06 16:18:13 2016
RFS[1]: Selected log 4 for thread 1 sequence 18 dbid 669994879 branch 929891597
Recovery of Online Redo Log: Thread 1 Group 4 Seq 18 Reading mem 0
  Mem# 0: /u04/app/oracle/redo/standby_redo01.log

```

Now perform a switchover

```

[oracle@srvdg-dg01 ~]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 6 16:18:02 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g EE Extreme Perf Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> alter system switch logfile;

System altered.

SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION SHUTDOWN;

Database altered.

SQL> startup mount
ORACLE instance started.

Total System Global Area 2655657984 bytes
Fixed Size 2256192 bytes
Variable Size 637534912 bytes
Database Buffers 2013265920 bytes
Redo Buffers 2600960 bytes
Database mounted.
SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;

Database altered.

SQL>

```

```

[oracle@srvdg-dg02 ~]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 6 16:20:02 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g EE Extreme Perf Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WITH SESSION SHUTDOWN;

Database altered.

SQL> alter database open;

Database altered.

SQL>

```

Switch the log file and see if it is applied to the new standby database

The image shows two terminal windows side-by-side. The left window, titled 'Overview', shows the output of a 'tail -f alert_PRODDB.log' command. It displays media recovery logs for PRODDb_01, including messages about End-Of-Redo, standby activation, and media recovery progress. The right window, titled 'oracle@srvdg-dg02/u01/app/oracle/diag/rdbms/proddb_02/PRODDb/trace', shows an SQL*Plus session where the user switches the database to primary mode with the command 'ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WITH SESSION SHUTDOWN;'. Subsequent commands include 'alter database open;', 'alter system switch logfile;', and 'System altered.'.

```

[oracle@srvdg-dg01/u01/app/oracle/diag/rdbms/proddb_01/PRODDb/trace]
[oracle@srvdg-dg01 trace]$ tail -f alert_PRODDB.log
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_01/archivelog/2016
_12_06/01_mf_1_17_d4fc4433_.arc
Tue Dec 06 16:20:58 2016
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_01/archivelog/2016
_12_06/01_mf_1_18_d4fc527g_.arc
Identified End-Of-Redo (switchover) for thread 1 sequence 18 at SCN 0x0.145151
Resetting standby activation ID 0 (0x0)
Media Recovery End-Of-Redo indicator encountered
Media Recovery Continuing
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_01/archivelog/2016
_12_06/01_mf_1_19_d4fc8f01_.arc
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_01/archivelog/2016
_12_06/01_mf_1_20_d4fc8ndk_.arc
Media Recovery Waiting for thread 1 sequence 21 (in transit)

Tue Dec 06 16:22:00 2016
RFS[2]: Selected log 5 for thread 1 sequence 22 dbid 669994879 branch 929891597
Tue Dec 06 16:22:00 2016
Archived Log entry 37 added for thread 1 sequence 21 ID 0x27eed7ea dest 1:
Tue Dec 06 16:22:02 2016
Media Recovery Log /u03/app/oracle/fast_recovery_area/PRODDb_01/archivelog/2016
_12_06/01_mf_1_21_d4fcc79m_.arc
Media Recovery Waiting for thread 1 sequence 22 (in transit)

[oracle@srvdg-dg02/u01/app/oracle/diag/rdbms/proddb_02/PRODDb/trace]
[oracle@srvdg-dg02 trace]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 6 16:20:02 2016
Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g EE Extreme Perf Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WITH SESSION SHUTDOWN;

Database altered.

SQL> alter database open;

Database altered.

SQL> alter system switch logfile;

System altered.

SQL>

```

Last Updated Time: 2016-12-06T11:48:32.606+0000

It worked. Now switch back

The image shows two terminal windows side-by-side. The left window, titled 'Overview', shows an SQL*Plus session where the user switches the database back to primary mode with the command 'ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WITH SESSION SHUTDOWN;'. The right window, titled 'oracle@srvdg-dg02/u01/app/oracle/diag/rdbms/proddb_02/PRODDb/trace', shows the output of the 'startup mount' command, displaying database statistics such as Total System Global Area, Fixed Size, Variable Size, Database Buffers, and Redo Buffers. The session then executes 'ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;' and 'Database altered.'.

```

[oracle@srvdg-dg01/u01/app/oracle/diag/rdbms/proddb_01/PRODDb/trace]
[oracle@srvdg-dg01 trace]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 6 16:22:28 2016
Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g EE Extreme Perf Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WITH SESSION SHUTDOWN;

Database altered.

SQL> ALTER DATABASE OPEN;

Database altered.

SQL>

[oracle@srvdg-dg02/u01/app/oracle/diag/rdbms/proddb_02/PRODDb/trace]
[oracle@srvdg-dg02 trace]$ sqlplus / as sysdba

SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION SHUTD
OWN;

Database altered.

SQL> startup mount
ORACLE instance started.

Total System Global Area 2655657984 bytes
Fixed Size 2256192 bytes
Variable Size 637534912 bytes
Database Buffers 2013265920 bytes
Redo Buffers 2600960 bytes
Database mounted.
SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;

Database altered.

SQL>

```

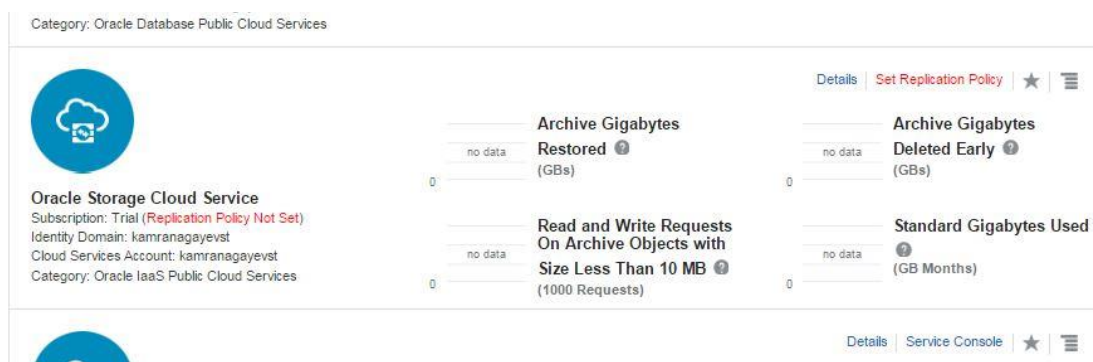
Last Updated Time: 2016

As you see, it's very easy to create a database with its own standby database in the cloud!

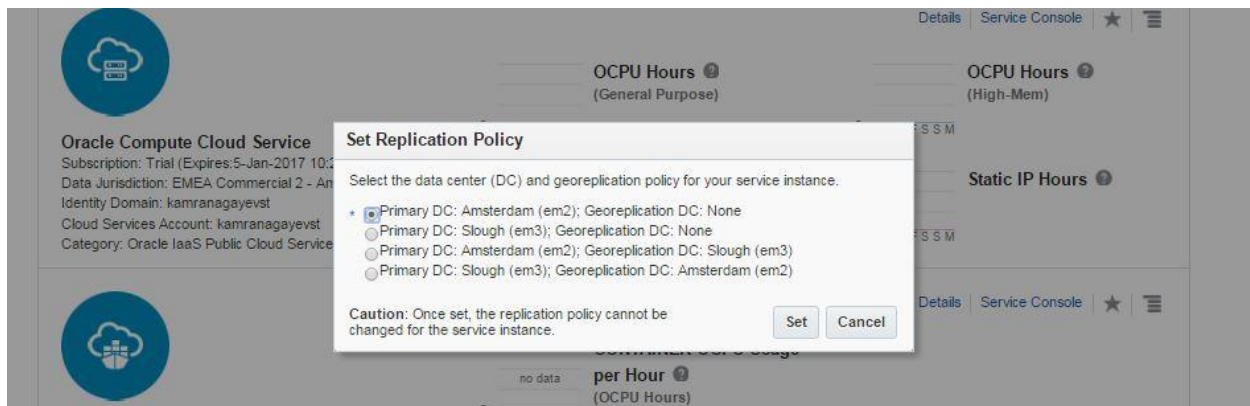
Configure and practice backup and recovery for Oracle Database in Cloud (DBaaS)

In this post I will show you how to configure backup for Oracle Database in Cloud. First of all, make sure you use Oracle Storage Cloud Service and you set the replication policy. Open the following link, scroll down to Oracle Storage Cloud Service section and click “Set Replication Policy” link:

<https://myservices.em2.oraclecloud.com/mycloud/faces/dashboard.jspx?showOld=true>



Select the data center and click Set



Next, open Oracle Database Cloud Service and create a new service. The GUI has changed and we have only 3 steps to create a database in the cloud. Provide the service name, software version and edition, upload SSH public key and click Next

Cancel

Service
Details
Confirmation

Next >

Service
Provide basic service instance information.

* Service Name ?

Description ?

* Subscription Type Oracle Database Cloud Service ?

* SSH Public Key mypublickey.pub Edit ?

* Software Release Oracle Database 11g Release 2 ?

* Software Edition Enterprise Edition ?

* Billing Frequency Monthly ?

In order to enable the automatic backup of the database in the cloud, you have to create a cloud storage container. Before creating a cloud storage container, switch to Oracle Storage Cloud Service details and get the REST Endpoint:

Service Details: Oracle Storage Cloud Service

Overview

Billing Metrics

Resource Quotas

Business Metrics

Documents

Additional Information

<p>Plan: Oracle Storage Cloud Service</p> <p>Service Start Date: 6-Dec-2016</p> <p>Service End Date: 5-Jan-2017</p> <p>Subscription ID: 554710184</p> <p>Service Instance ID: 554710561</p> <p>Customer Account: AzerCell Telecom (AZ)</p>	<p>CSI Number: Not available</p> <p>Data Center: EMEA Commercial 2 - Amsterdam</p> <p>Status: Active</p> <p>Domain SFTP Host & Port: sftp2.em2.cloud.oracle.com:22</p> <p>Domain SFTP User Name: kamranRC ?</p> <p>REST Endpoint: https://kamranagayevst stor</p>
---	---

Next, open <https://storageconsole.em2.oraclecloud.com/> link, provide the Service REST Endpoint and login to Oracle Storage Cloud Service:

Login to Oracle Storage Cloud Service

Service REST Endpoint *

https://kamranagayevst.storage.oraclecloud.com/services/

Username *

admin@kamranagayevst.com

Password *

Login

Create a new storage container:

Create a Storage Container

Create a container by providing a name and assigning it a container type.

* Name backupcontainer

Storage Class Standard

Create Cancel

ORACLE Cloud My Services admin

Storage-kamranagayevst / backupcontainer

Container Information Enable Upload and Download

Upload Object(s)

Name	Last Modified	Size
No data to display.		

In the second screen of database service creation page, select “Both Cloud Storage and Local Storage” option as a Backup Destination, provide cloud storage container name, username and password and click Next.

Service Details

Provide details for this Oracle Database Cloud Service instance.



Service Configuration

* Compute Shape

OC3 - 1 OCPU, 7.5 GB RAM

* Timezone

(UTC) Coordinated Universal



Database Configuration

* Usable Database Storage (GB)

25

Total Data File Storage (GB)

88.5

* Administration Password

* Confirm Password

* DB Name (SID)

TESTDB



Standby Database Configuration

Standby Database with Data Guard ☐



Backup and Recovery Configuration

* Backup Destination

Both Cloud Storage and Local Storage

* Cloud Storage Container

Storage-kamranagayevst/backu

* Cloud Storage Username

itakamran@azercell.com

* Cloud Storage Password

Create Cloud Storage Container

☐

Total Estimated Monthly Storage (GB)

140

* Create Instance from Existing Backup

No

* Character Set

AL32UTF8 - Unicode Uni

* National Character Set

AL16UTF16 - Unicode U

Enable Oracle GoldenGate

☐

Review the configuration and click Create button.

Confirmation

Confirm your responses and create this Oracle Database Cloud Service instance.



Subscription Details

Service Level: Oracle Database Cloud Service
Billing Frequency: Monthly
Software Release: Oracle Database 11g Release 2
Software Edition: Enterprise Edition



Service Details

Service Name: srvtst
Description:
Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM
Timezone: (UTC) Coordinated Universal Time(UTC)
Key: mypublickey.pub



Standby Database Configuration Details

Standby Database with Data Guard: No



Backup and Recovery Details

Backup Destination: Both Cloud Storage and Local Storage
Username: itakamran@azercell.com
Cloud Storage Container: Storage-kamranagayevst/backupcontainer



Database Configuration Details

Usable Database Storage: 25
Total Data File Storage: 88.5
DB Name (SID): TESTDB
Character Set: AL32UTF8 - Unicode Universal character set UTF-8 form
Set: 32-bit
National Character Set: AL16UTF16 - Unicode UTF-16 Universal character
Set: set
Include GoldenGate: No

After creating the service successfully, open it and click on Administration section. From the Backup tab

click on Backup Now button to create a backup of the database. You can use RMAN and schedule your own backups as well.

The screenshot displays the Oracle Database Cloud Service console for a service named 'srvtest'. The left sidebar contains navigation links: 'Overview' (1 Node), 'Administration' (1 Patches available, View available backups), and 'Snapshots' (0 Snapshots available). The main content area is divided into tabs: 'Backup', 'Patching', and 'Snapshots'. The 'Backup' tab is active, showing a timestamp 'As of Dec 13, 2016 11:24:43 AM UTC' and a description: 'Perform on demand backup and recovery operations. Recovery can be a point in time recovery using database tag, timestamp or system change number.' Below this are three buttons: 'Backup Now', 'Recover', and 'Configure Backups'. Under the 'Available Backups' section, a message states 'No backups available.' A terminal window is open, showing a login session for 'opc' at 'oracle@srvtest/home/opc'. The user runs 'sudo -s' to become root, then 'su oracle' to switch to the oracle user. Finally, they run 'rman target /', which connects to the target database 'TESTDB (DBID=2713817523)'. The RMAN prompt shows 'list backupset summary;', and the output indicates that the target database control file does not match any backup in the repository.

```
oracle@srvtest/home/opc
login as: opc
Authenticating with public key "rsa-key-20161203"
Passphrase for key "rsa-key-20161203":
[opc@srvtest ~]$ sudo -s
[root@srvtest opc]# su oracle
[oracle@srvtest opc]$ rman target /

Recovery Manager: Release 11.2.0.4.0 - Production on Tue Dec 13 11:25:22 2016

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connected to target database: TESTDB (DBID=2713817523)

RMAN> list backupset summary;

using target database control file instead of recovery catalog
specification does not match any backup in the repository

RMAN>
```

Click Backup Now and check the log file for more information:

Oracle Database Cloud Service / srvtest

Backup request was submitted.

Overview

1 Node

Administration

1 Patches available

Backing up..

0 Snapshots available

Backup Patching Snapshots

Perform on demand backup and recovery operation change number.

Backup in progress from Dec 13, 2016 11:28

Available Backups

Dec 13, 2016 11:28:15 AM

Recovery History

```

root@srvtest:/home/opc
Tue, 13 Dec 2016 11:28:16 3debf678-c127-11e6-8ad2-c6b0e87f74cb -> Starting execution of backup log in background
Tue, 13 Dec 2016 11:28:16 3debf678-c127-11e6-8ad2-c6b0e87f74cb STARTING BACKUP REQUEST
Tue, 13 Dec 2016 11:28:16 ** process started with PID: 24528
Tue, 13 Dec 2016 11:28:16 ** see log file for monitor progress
Tue, 13 Dec 2016 11:28:16 3debf678-c127-11e6-8ad2-c6b0e87f74cb Checking if TESTDB resource is available
Tue, 13 Dec 2016 11:28:16 -----
Tue, 13 Dec 2016 11:28:16 3debf678-c127-11e6-8ad2-c6b0e87f74cb registering request into the database
Tue, 13 Dec 2016 11:28:16 UUID 3debf678-c127-11e6-8ad2-c6b0e87f74cb written with PID 24528
Tue, 13 Dec 2016 11:28:18 3debf678-c127-11e6-8ad2-c6b0e87f74cb current backups 0
Tue, 13 Dec 2016 11:28:18 3debf678-c127-11e6-8ad2-c6b0e87f74cb command /home/oracle/bkup/TESTDB/obkup -dbname=TESTDB
Tue, 13 Dec 2016 11:28:18 DBaaS Backup API V1.5 @2016 Multi-Oracle home
Tue, 13 Dec 2016 11:28:18 DBaaS Backup API V1.5 @2015 Multi-Oracle home
Tue, 13 Dec 2016 11:28:18 -> Action : bkup_status
Tue, 13 Dec 2016 11:28:18 -> logfile: /var/opt/oracle/bkup_api/log/bkup_api.log
Tue, 13 Dec 2016 11:28:21 DBaaS Backup API V1.5 @2016 Multi-Oracle home
Tue, 13 Dec 2016 11:28:21 DBaaS Backup API V1.5 @2015 Multi-Oracle home
Tue, 13 Dec 2016 11:28:21 -> Action : list
Tue, 13 Dec 2016 11:28:21 -> logfile: /var/opt/oracle/bkup_api/log/bkup_api.log
Tue, 13 Dec 2016 11:28:21 -> Listing all backups
Tue, 13 Dec 2016 11:28:21 -> Listing all backups
Tue, 13 Dec 2016 11:28:21 This environment is still clean, no completed backups
Tue, 13 Dec 2016 11:29:20 DBaaS Backup API V1.5 @2016 Multi-Oracle home
Tue, 13 Dec 2016 11:29:20 DBaaS Backup API V1.5 @2015 Multi-Oracle home
Tue, 13 Dec 2016 11:29:20 -> Action : bkup_status
Tue, 13 Dec 2016 11:29:20 -> logfile: /var/opt/oracle/bkup_api/log/bkup_api.log
Tue, 13 Dec 2016 11:30:23 DBaaS Backup API V1.5 @2016 Multi-Oracle home
Tue, 13 Dec 2016 11:30:23 DBaaS Backup API V1.5 @2015 Multi-Oracle home
Tue, 13 Dec 2016 11:30:23 -> Action : bkup_status
Tue, 13 Dec 2016 11:30:23 -> logfile: /var/opt/oracle/bkup_api/log/bkup_api.log
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb backups after execution 6
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T113019
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T112905
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T112932
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T113008
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T113011
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb rman tag TAG20161213T112924
Tue, 13 Dec 2016 11:30:25 3debf678-c127-11e6-8ad2-c6b0e87f74cb Backup succeeded TAG20161213T112924
4

```

If you switch to the storage container, you will see bunch of files created

Storage-kamranagayevst / backupcontainer

► Container Information

Enable Upload and Download

Upload Object(s)

Name	Last Modified	Size	
file_chunk/2713817523/TES.../KTVs8w9V0wwD/0000000001	11 minutes ago	64.2 MB	Actions ▾
file_chunk/2713817523/TES...TVs8w9V0wwD/metadata.xml	11 minutes ago	1.75 KB	Actions ▾
file_chunk/2713817523/TES.../KTVs8w9V0wwD/0000000001	11 minutes ago	262 KB	Actions ▾
file_chunk/2713817523/TES...TVs8w9V0wwD/metadata.xml	11 minutes ago	1.75 KB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000001	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000002	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000003	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000004	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000005	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000006	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000007	11 minutes ago	82.1 MB	Actions ▾
file_chunk/2713817523/TES...yH3tH16jobK/metadata.xml	11 minutes ago	1.75 KB	Actions ▾
file_chunk/2713817523/TES.../KTVs8w9V0wwD/0000000001	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000006	11 minutes ago	105 MB	Actions ▾
file_chunk/2713817523/TES.../ZyH3tH16jobK/0000000007	11 minutes ago	82.1 MB	Actions ▾

Open RMAN and run LIST BACKUPSET SUMMARY command to get list of backupsets:

```

[oracle@srvtest ~]$ rman target /
Recovery Manager: Release 11.2.0.4.0 - Production on Tue Dec 13 12:14:13 2016
Copyright (c) 1982, 2011, Oracle and/or its affiliates. All rights reserved.
connected to target database: TESTDB (DBID=2713817523)

RMAN> list backupset summary;

using target database control file instead of recovery catalog

List of Backups
=====
Key          TY LV S Device Type Completion Time #Pieces #Copies Compressed Tag
-----
1           B A A *          13-DEC-16          1      2      NO      DBAAS_INCR_BACKUP
2           B A A *          13-DEC-16          1      2      NO      DBAAS_INCR_BACKUP
3           B F A *          13-DEC-16          1      2      NO      TAG20161213T112905
4           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112924
5           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112932
6           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112932
7           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112932
8           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112932
9           B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T112932
10          B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T113008
11          B A A SBT_TAPE    13-DEC-16          1      1      YES     TAG20161213T113011
12          B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T113019
13          B A A SBT_TAPE    13-DEC-16          1      1      YES     TAG20161213T120009
14          B F A SBT_TAPE    13-DEC-16          1      1      NO      TAG20161213T120016

RMAN>

```

Now let's try to recover the database to the specific point in time using DBaaS wizard. For this, create a new table with some data, get the current SCN number and drop the table.

```
[oracle@srvtest ~]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 13 12:14:57 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> create table mytable as select * from dba_objects;

Table created.

SQL> select count(1) from mytable;

COUNT(1)
-----
      88910

SQL> select current_scn from v$database;

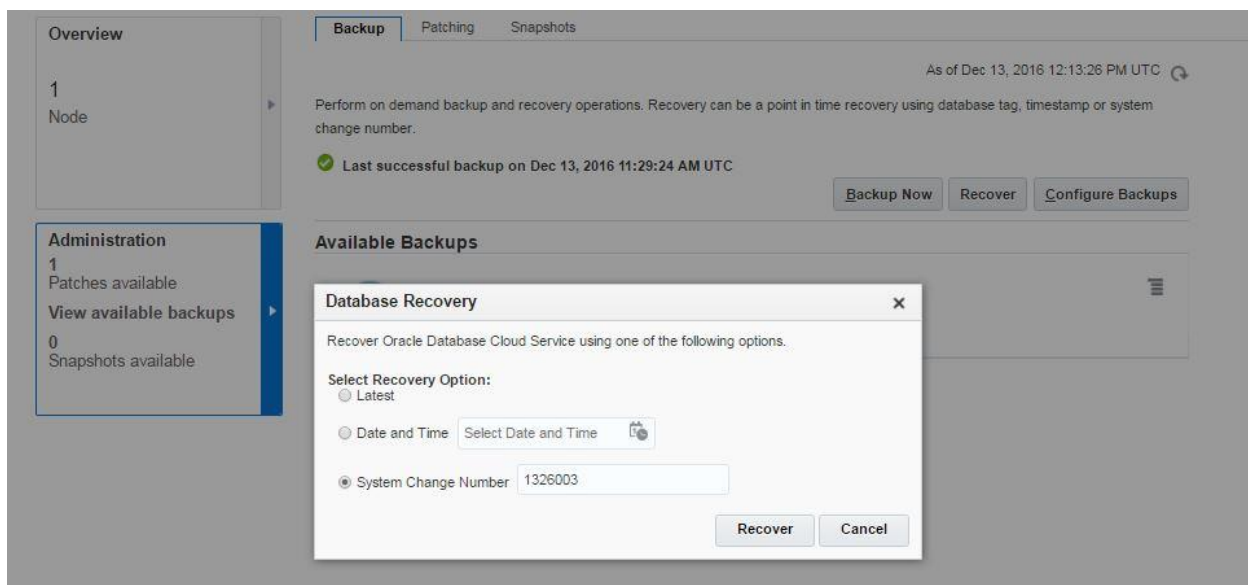
CURRENT_SCN
-----
      1326003

SQL> drop table mytable purge;

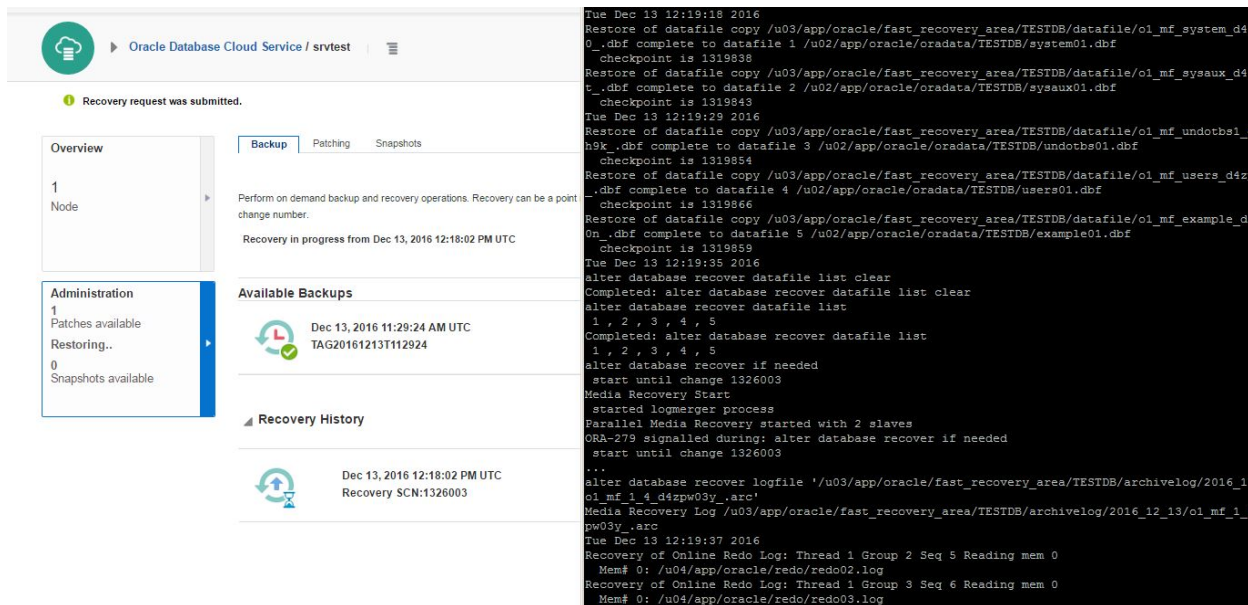
Table dropped.

SQL> █
```

Next, switch to DBaaS backup page, click Recover, provide the SCN number and click Recover



The recover process will run in the background automatically. Check alert.log file of the database for more information:



The screenshot displays the Oracle Database Cloud Service console for a service named 'srvtest'. A notification at the top states 'Recovery request was submitted.' The left sidebar shows the 'Overview' tab selected, with a 'Node' count of 1. The main content area is divided into three sections: 'Backup', 'Patching', and 'Snapshots'. The 'Backup' section shows a recovery in progress from Dec 13, 2016 12:18:02 PM UTC. The 'Available Backups' section lists a backup from Dec 13, 2016 11:29:24 AM UTC with TAG20161213T112924. The 'Recovery History' section shows a recovery from Dec 13, 2016 12:18:02 PM UTC with Recovery SCN:1326003. On the right, a terminal window shows the alert.log output, detailing the recovery process for datafiles 1 through 5, including checkpoint numbers and the completion of the recovery.

After the recover process is completed successfully login to the database and query the table

```
[oracle@srvtest trace]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Dec 13 12:21:27 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> select count(1) from mytable;

COUNT(1)
-----
      88910

SQL>
```

You can also take backup and recover the database from command line interface using bkup_api utility. Now let's delete all backups, take a new backup and try the recovery.

Delete all available RMAN backups:

```
RMAN> delete backup;
```

Use bkup_api utility with bkup_start parameter to take a backup from CLI:

```
[root@srvtest spool]# /var/opt/oracle/bkup_api/bkup_api bkup_start
```

```
DBaaS Backup API V1.5 @2016 Multi-Oracle home
```

```
DBaaS Backup API V1.5 @2015 Multi-Oracle home
```

```
-> Action : bkup_start
```

```
-> logfile: /var/opt/oracle/bkup_api/log/bkup_api.log
```

```
UUID d6bf0bde-c130-11e6-8534-c6b0e87f74cb for this backup
```

```
** process started with PID: 16524
```

```
** see log file for monitor progress
```

```
_____
```

```
[root@srvtest spool]#
```

Check the log file for more information:

```
[root@srvtest spool]# tail -f /var/opt/oracle/bkup_api/log/bkup_api.log
Tue, 13 Dec 2016 12:36:58 ** process started with PID: 16524
Tue, 13 Dec 2016 12:36:58 ** see log file for monitor progress
Tue, 13 Dec 2016 12:36:58 -----
Tue, 13 Dec 2016 12:36:58 d6bf0bde-c130-11e6-8534-c6b0e87f74cb Checking if
TESTDB resource is available
Tue, 13 Dec 2016 12:36:58 d6bf0bde-c130-11e6-8534-c6b0e87f74cb has a lock
TESTDB
Tue, 13 Dec 2016 12:36:58 UUID d6bf0bde-c130-11e6-8534-c6b0e87f74cb written
with PID 16524
Tue, 13 Dec 2016 12:36:58 d6bf0bde-c130-11e6-8534-c6b0e87f74cb The process is
no longer running removing lock
Tue, 13 Dec 2016 12:36:58 d6bf0bde-c130-11e6-8534-c6b0e87f74cb registering
request into the database
Tue, 13 Dec 2016 12:37:00 d6bf0bde-c130-11e6-8534-c6b0e87f74cb current
backups 0
Tue, 13 Dec 2016 12:37:00 d6bf0bde-c130-11e6-8534-c6b0e87f74cb command
/home/oracle/bkup/TESTDB/obkup -dbname=TESTDB
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb@ backups after
execution 4
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb rman tag
TAG20161213T123750
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb rman tag
TAG20161213T123729
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb rman tag
TAG20161213T123758
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb rman tag
TAG20161213T123834
Tue, 13 Dec 2016 12:38:51 d6bf0bde-c130-11e6-8534-c6b0e87f74cb Backup
succeeded TAG20161213T123834
```

Now having valid backups, let's create a new table, drop it and recover it using dbaascli utility.


```

[oracle@srvtest opc]$ sqlplus / as sysdba
SQL> create table mytable2 as select * from dba_objects;
Table created.

SQL> select count(1) from mytable2;

COUNT(1)
-----
      88911

SQL> select current_scn from v$database;

CURRENT_SCN
-----
1333654

SQL> drop table mytable2 purge;
Table dropped.

SQL> exit

```

Now use dbaascli utility and provide the SCN number to perform SCN based incomplete recovery:

```

[root@srvtest opc]# dbaascli orec -args -scn 1333654
DBAAS CLI version 1.0.0
Executing command orec -args -scn 1333654
-args : -scn 1333654
OREC version: 16.0.0.0
Starting OREC
Logfile is /var/opt/oracle/log/TESTDB/orec/orec_2016-12-13_13:41:18.log
Config file is /var/opt/oracle/orec/orec.cfg
DB name: TESTDB
OREC:: RUNNING IN NON DATAGUARD ENVIRONMENT
OREC:: Verifying scn validity...
PITR using SCN: 1333654

```

```

OREC:: Catalog mode: Disabled
OREC:: Checking prerequisites before recovery process.
OREC:: DB Status : OPEN
OREC:: Changing instance to MOUNT stage.
OREC:: Shutting down the database... Completed.
OREC:: (RMAN) Startup MOUNT... Completed.
OREC:: Checking for PDBs directories.
OREC:: Checking for REDO logs.
OREC:: Restablishing DB instance to the original stage.
OREC:: Shutting down the database... Completed.
OREC:: Starting up database... Completed.
OREC:: Testing RMAN connection.
OREC:: Verifying backups dates ..
      :: OK
OREC:: Performing PITR using SCN number 1333654 ...
INFO : DB instance is up and running after recovery procedure.
OREC:: Completed.
[root@srvtest opc]#

```

Now connect to the database and check if the table is recovered:

```

[oracle@srvtest opc]$ sqlplus / as sysdba
SQL> select count(1) from mytable2;
      COUNT(1)
-----
      88911
SQL>

```

The database backups are also stored in the flash recovery area image-16in the database host:

```
[oracle@srvtest 2016_12_13]$ pwd
/u03/app/oracle/fast_recovery_area/TESTDB/backupset/2016_12_13
[oracle@srvtest 2016_12_13]$ ls -ltr
total 117912
-rw-rw---- 1 oracle oinstall 89445376 Dec 13 12:37 o1_mf_annnn_DBAAS_INCR_BACKUP_d4ztvbk2_.bkp
-rw-rw---- 1 oracle oinstall 1971712 Dec 13 12:37 o1_mf_annnn_DBAAS_INCR_BACKUP_d4ztvypo_.bkp
-rw-rw---- 1 oracle oinstall 29310976 Dec 13 12:37 o1_mf_nnnd1_DBAAS_INCR_BACKUP_d4ztw1y7_.bkp
-rw-rw---- 1 oracle oinstall 4608 Dec 13 12:37 o1_mf_annnn_DBAAS_INCR_BACKUP_d4ztw876_.bkp
[oracle@srvtest 2016_12_13]$
```

If you want to change the automatic backup schedule, edit /etc/crontab file with a root user. Below you can see the current schedule of the database backup:

```
[root@srvtest opc]# more /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=""
HOME=/

# For details see man 4 crontabs

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# | | | | |
# * * * * * user-name command to be executed

13 0 * * * root /var/opt/oracle/bkup_api/bkup_api bkup start --dbname=TESTDB
0,30 * * * * root /home/oracle/bkup/TESTDB/obkup -dbname=TESTDB -archivelog
15 03 * * 6 oracle /var/opt/oracle/cleandb/cleandblogs.pl
[root@srvtest opc]#
```

You can use a DBaaS backup wizard, DBaaS command line interface commands and RMAN to perform backup and recovery for Oracle Database in Cloud

Create a Standby database in Oracle Cloud for On-Premises production database

If you have a production database and you plan to build a standby database on the different geographic location, Oracle Cloud is the best option. In this blog post you will see a step by step guide on how to create a Standby Database in Oracle Cloud for your on-premises database.

First of all, login to your Oracle Cloud account, switch to Oracle Database Cloud Service and create a new Service. Provide a service name, SSH Public Key (check above mentioned articles to see how to create a SSH public key), choose “Enterprise Edition – Extreme Performance” for Software Edition option and click Next.

Cancel

Service Details Confirmation

Service
Provide basic service instance information.

* Service Name ?

Description ?

* Subscription Type ?

* SSH Public Key Edit ?

* Software Release ?

* Software Edition ?

* Billing Frequency ?

We will create a standby database based on on-premises production database, so in the next screen provide any database name. We will delete it once it is created and will create a standby database using DUPLICATE DATABASE command.

Previous
Cancel

Service
Details
Confirmation

Next

Service Details

Provide details for this Oracle Database Cloud Service instance.

Service Configuration

* Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM

* Timezone: (UTC) Coordinated Universal

Backup and Recovery Configuration

* Backup Destination: None

Database Configuration

* Usable Database Storage (GB): 25

Total Data File Storage (GB): 88.5

* Administration Password: [password]

* Confirm Password: [password]

* DB Name (SID): ORCL

* DB Listener Port: 1521

Total Estimated Monthly Storage (GB): N/A

* Create Instance from Existing Backup: No

* Character Set: AL32UTF8 - Unicode Un

AL16UTF16 - Unicode U

Database name of your choice, up to 8 characters; must begin with a letter and can contain only letters and numbers.

Database Clustering with RAC: ☐

Enable Oracle GoldenGate: ☐

Standby Database Configuration

Standby Database with Data Guard: ☐

Review the configuration and click Create to create a Database Cloud Service instance.

It take only 20 minutes to create a new machine, install an Oracle Software and create a new database in the cloud.

Next, create a new virtual machine in your own laptop, install Oracle 11.2.4 on Linux (OEL is preferred) and add two network cards – “Host-only Adapter” and “Bridged Adapter”. “Host-Only Adapter” is used to connect to the virtual machine from the host machine and “Bridged Adapter” is used to connect from the Virtual Machine to the outside world (internet, cloud instance and etc.). Enable both network devices, make sure you have internet connection, edit tnsnames.ora file as follows and use tnsping to ping the cloud host.

```

STBDB =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = 140.86.3.98) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = STBDB)
      (UR = A)
    )
  )

```

Next, use private key to connect to the cloud machine using putty and drop the ORCL database in the cloud machine

Drop the database in the cloud machine:

```

[oracle@srvtst ~]$ sqlplus / as sysdba
SQL> startup force mount exclusive restrict;
ORACLE instance started.

Total System Global Area 2655657984 bytes
Fixed Size                  2256192 bytes
Variable Size               637534912 bytes
Database Buffers           1996488704 bytes
Redo Buffers                 19378176 bytes
Database mounted.

SQL> drop database;
Database dropped.

SQL>

```

Before trying to connect to the new dummy instance on the cloud machine, you have to enable dblistener access rule. Open the database service and Access Rule from the menu.

The screenshot displays the Oracle Database Cloud Service console interface. At the top, the breadcrumb navigation shows 'Oracle Database Cloud Service / srvtst'. A dropdown menu is open, listing several actions: 'Open DBaaS Monitor Console', 'Open Application Express Console', 'Open EM Console', 'SSH Access', 'Access Rules' (highlighted), 'Replace Database using Backup', and 'View Activity'. The main content area shows a summary of the database instance 'srvtst', including '1 Node', '5 GB Memory', and '150 GB Storage'. Below this, the 'Database' section shows 'Edition: Enterprise Edition - Extreme Performance' and 'Location: EM002_Z13'. The 'Resources' section lists 'SQL *Net Port: 1521', 'SID: ORCL', 'OCPUs: 1', 'Memory: 7.5 GB', and 'Storage: 150 GB'. The 'Additional Information' section provides the 'Connect String', 'Timezone', 'Character Set', and 'National Character Set'.

Overview

1 Node

Administration

0 Patches available

0 Snapshots available

Summary 1 Nodes

5 GB Memory

150 GB Storage

As of Jan 20, 2017 7:06:44 PM UTC Healthcheck

Status: Running

Service Level: Oracle Database Cloud Service

Backup Destination: None

Database

Edition: Enterprise Edition - Extreme Performance

Location: EM002_Z13

Resources

srvtst

Public IP: 140.86.3.98

SQL *Net Port: 1521

SID: ORCL

OCPUs: 1

Memory: 7.5 GB

Storage: 150 GB

Additional Information


Connect String: srvtst:1521/ORCL@EM002_Z13

Timezone: Armenia Time

Character Set: AL32UTF8 - Unicode Universal character set UTF-8 form 32-bit

National Character Set: AL16UTF16 - Unicode UTF-16 Universal character set

Click on Actions menu for the ora_p2_dblistener rule and enable it


Oracle Database Cloud Service / srvts / Access Rules

Access Rules

You can use access rules to control network access to service components. On this page, you can manage your access rules.

Results per page: 10 9 result(s) as of Jan 20, 2017 7:07:57 PM UTC

Status	Rule Name	Source	Destination	Ports	Protocol	Description	Rule Type	Actions
	ora_p2_ssh	PUBLIC-INTERNET	DB	22	TCP		DEFAULT	
	ora_p2_http	PUBLIC-INTERNET	DB	80	TCP		DEFAULT	
	ora_p2_https	PUBLIC-INTERNET	DB	443	TCP		DEFAULT	
	ora_p2_httpadmin	PUBLIC-INTERNET	DB	4848	TCP		DEFAULT	
	ora_p2_dbconsole	PUBLIC-INTERNET	DB	1158	TCP		DEFAULT	
	ora_p2_dbexpress	PUBLIC-INTERNET	DB	5500	TCP		DEFAULT	
	ora_p2_dblistener	PUBLIC-INTERNET	DB	1521	TCP		DEFAULT	<div> Enable Disable Delete </div>
	sys_infra2db_ssh	PAAS-INFRA	DB	22	TCP	DO NOT MODIFY: Permit P...	SYSTEM	
	ora_trusted_hosts_dbli...	127.0.0.1/32	DB	1521	TCP	DO NOT MODIFY: A secur...	SYSTEM	

Now you will be able to using tnsping to test the connection:

```
[oracle@ocm11g admin]$ tnsping STBDB

Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL =
TCP)(HOST = 140.86.3.98)(PORT = 1521))) (CONNECT_DATA = (SERVICE_NAME =
STBDB) (UR = A)))

OK (250 msec)

[oracle@ocm11g admin]$
```

In order to connect to the cloud machine from outside, you need to configure SSH. Open Virtual Machine box, switch to .ssh folder and generate ssh key using ssh-keygen utility as follows:

```
[oracle@ocm11g ~]$ cd .ssh
[oracle@ocm11g .ssh]$ ssh-keygen

Generating public/private rsa key pair.

Enter file in which to save the key (/home/oracle/.ssh/id_rsa):

Enter passphrase (empty for no passphrase):

Enter same passphrase again:

Your identification has been saved in /home/oracle/.ssh/id_rsa.
```


Your public key has been saved in /home/oracle/.ssh/id_rsa.pub.

The key fingerprint is:

1f:e8:8d:08:78:80:12:e5:c6:cb:cb:7a:97:2e:1b:02 oracle@ocm11g

The key's randomart image is:

```
+--[ RSA 2048]--+
|...                |
| =                  |
|o =                 |
|.o +                |
|E + o  S .          |
|.. o . o + .        |
|. + .. o o          |
| oo.o               |
|...=.               |
+-----+
[oracle@ocm11g .ssh]$
```

Now copy the source of id_rsa.pub file and append it to the /home/oracle/.ssh/authorized_keys file at the cloud machine.

```
[oracle@ocm11g .ssh]$ more id_rsa.pub
ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEAn2fjBDvcycbxQxVrzFQS2URSERkdJXTdpHGw68GiQWUnCR8T8
jSwntDWH4az37Lyj7WgN0NGW7HFWC0m9EMJ/RfCPj6SXnCjdXOO2qwuxMit9B9suqm7plfQl+HpGT
rdx6KIW2UXW1M/712CDNjJD7zDFZ4MNwBIOt1T5lpHm61iquVeBUwFg/3fjpnk6/IjX5K0mM8gLHW
pc6WEDLcLKHgKWcVUGvY/KF1W2ehbGIO6tSDkDV2wwEj8H5G5DCxLs2Mczqldzgt99SLVpw3s7/aG
RWrzPVRVPjmn1Y7AHnDFNFvP32V3fzKCaAHHQLjDeA6ZQyjMjBUFAxWuiymunw==
oracle@ocm11g
```

Now test the connection from virtual box to the cloud machine:

```
[oracle@ocm11g .ssh]$ ssh 140.86.3.98
The authenticity of host '140.86.3.98 (140.86.3.98)' can't be established.
RSA key fingerprint is 73:93:3c:62:41:d4:12:aa:09:07:c7:94:aa:ea:00:16.
```

```
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '140.86.3.98' (RSA) to the list of known hosts.
[oracle@srvtst ~]$ exit
logout
Connection to 140.86.3.98 closed.
```

Before duplicating the database, create necessary folders on the cloud machine

```
[oracle@ocml1g .ssh]$ ssh 140.86.3.98
[oracle@srvtst ~]$ mkdir -p admin/STBDB/adump
[oracle@srvtst ~]$ mkdir -p oradata/STBDB
[oracle@srvtst ~]$ mkdir flash_recovery_area
[oracle@srvtst ~]$ mkdir arch
```

Create a parameter file to start standby instance:

```
vi /home/oracle/pfile.ora
*.audit_file_dest='/home/oracle/admin/STBDB/adump'
*.control_files='/home/oracle/oradata/STBDB/control01.ctl'
*.db_file_name_convert='/u03/oracle/oradata/PROD/', '/home/oracle/oradata/STBD
B/'
*.db_name='PROD'
*.db_unique_name='STBDB'
*.db_recovery_file_dest='/home/oracle/flash_recovery_area'
*.db_recovery_file_dest_size=5g
*.fal_client='STBDB'
*.fal_server='PROD'
*.log_archive_dest_1='location=/home/oracle/arch
VALID_FOR=(ALL_LOGFILES,ALL_ROLES)
```

```
DB_UNIQUE_NAME=STBDB'  
*.log_file_name_convert='/u03/oracle/oradata/PROD/', '/home/oracle/oradata/STB  
DB/'  
*.compatible='11.2.0.4.0'
```

Connect to SQL*Plus, create spfile and open the instance in the NOMOUNT mode:

```
[oracle@srvtst ~]$ sqlplus / as sysdba
```

Connected to an idle instance.

```
SQL> startup nomount pfile='/home/oracle/pfile.ora';  
ORACLE instance started.  
  
Total System Global Area  229683200 bytes  
Fixed Size                  2251936 bytes  
Variable Size              171967328 bytes  
Database Buffers           50331648 bytes  
Redo Buffers                5132288 bytes  
SQL> create spfile from pfile='/home/oracle/pfile.ora';  
File created.
```

```
SQL> shut immediate  
ORA-01507: database not mounted  
ORACLE instance shut down.
```

```
SQL> startup nomount;  
ORACLE instance started.  
  
Total System Global Area  229683200 bytes  
Fixed Size                  2251936 bytes  
Variable Size              171967328 bytes  
Database Buffers           50331648 bytes  
Redo Buffers                5132288 bytes  
SQL>
```

Create a password file on the standby machine

```
[oracle@srvtst ~]$ orapwd  
file=/u01/app/oracle/product/11.2.0/dbhome_1/dbs/orapwSTBDB password=oracle  
entries=5
```

Connect to both target and auxiliary instances and duplicate the database:

```
[oracle@ocml1g dbs]$ rman target sys/oracle@PROD auxiliary sys/oracle@STBDB  
connected to target database: PROD (DBID=345613202)  
connected to auxiliary database: PROD (not mounted)
```

```
RMAN> duplicate target database for standby from active database;  
Starting Duplicate Db at 20-JAN-17  
using target database control file instead of recovery catalog  
allocated channel: ORA_AUX_DISK_1  
channel ORA_AUX_DISK_1: SID=171 device type=DISK  
contents of Memory Script:  
{  
    backup as copy reuse  
        targetfile '/u03/oracle/product/11.2.4/db_1/dbs/orapwPROD' auxiliary  
format  
        '/u01/app/oracle/product/11.2.0/dbhome_1/dbs/orapwSTBDB' ;  
}
```

executing Memory Script

```
Starting backup at 20-JAN-17  
allocated channel: ORA_DISK_1  
channel ORA_DISK_1: SID=36 device type=DISK  
Finished backup at 20-JAN-17  
contents of Memory Script:  
{
```

```
backup as copy current controlfile for standby auxiliary format
'/home/oracle/oradata/STBDB/control01.ctl';
}
```

executing Memory Script

Starting backup at 20-JAN-17

using channel ORA_DISK_1

channel ORA_DISK_1: starting datafile copy

copying standby control file

output file name=/u03/oracle/product/11.2.4/db_1/dbs/snapcf_PROD.f
tag=TAG20170120T145657 RECID=3 STAMP=933778620

channel ORA_DISK_1: datafile copy complete, elapsed time: 00:02:05

Finished backup at 20-JAN-17

contents of Memory Script:

```
{
    sql clone 'alter database mount standby database';
}
```

executing Memory Script

sql statement: alter database mount standby database

contents of Memory Script:

```
{
    set newname for tempfile 1 to "/home/oracle/oradata/STBDB/temp01.dbf";
    switch clone tempfile all;
    set newname for datafile 1 to "/home/oracle/oradata/STBDB/system01.dbf";
    set newname for datafile 2 to "/home/oracle/oradata/STBDB/sysaux01.dbf";
    set newname for datafile 3 to
"/home/oracle/oradata/STBDB/undotbs01.dbf";
    set newname for datafile 4 to "/home/oracle/oradata/STBDB/users01.dbf";
    backup as copy reuse datafile 1 auxiliary format
"/home/oracle/oradata/STBDB/system01.dbf"
datafile 2 auxiliary format "/home/oracle/oradata/STBDB/sysaux01.dbf"
datafile 3 auxiliary format "/home/oracle/oradata/STBDB/undotbs01.dbf"
```

```
datafile 4 auxiliary format "/home/oracle/oradata/STBDB/users01.dbf" ;  
    sql 'alter system archive log current';  
}
```

executing Memory Script

executing command: SET NEWNAME

renamed tempfile 1 to /home/oracle/oradata/STBDB/temp01.dbf in control file

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME

Starting backup at 20-JAN-17

using channel ORA_DISK_1

channel ORA_DISK_1: starting datafile copy

input datafile file number=00001 name=/u03/oracle/oradata/PROD/system01.dbf

output file name=/home/oracle/oradata/STBDB/system01.dbf

tag=TAG20170120T145917

channel ORA_DISK_1: datafile copy complete, elapsed time: 02:14:37

channel ORA_DISK_1: starting datafile copy

input datafile file number=00002 name=/u03/oracle/oradata/PROD/sysaux01.dbf

output file name=/home/oracle/oradata/STBDB/sysaux01.dbf

tag=TAG20170120T145917

channel ORA_DISK_1: datafile copy complete, elapsed time: 01:24:17

channel ORA_DISK_1: starting datafile copy

input datafile file number=00003 name=/u03/oracle/oradata/PROD/undotbs01.dbf

output file name=/home/oracle/oradata/STBDB/undotbs01.dbf

tag=TAG20170120T145917

channel ORA_DISK_1: datafile copy complete, elapsed time: 00:05:15

channel ORA_DISK_1: starting datafile copy

input datafile file number=00004 name=/u03/oracle/oradata/PROD/users01.dbf

output file name=/home/oracle/oradata/STBDB/users01.dbf

tag=TAG20170120T145917

channel ORA_DISK_1: datafile copy complete, elapsed time: 00:00:56

```

Finished backup at 20-JAN-17

sql statement: alter system archive log current
contents of Memory Script:
{
    switch clone datafile all;
}
executing Memory Script

datafile 1 switched to datafile copy
input datafile copy RECID=3 STAMP=933824671 file
name=/home/oracle/oradata/STBDB/system01.dbf

datafile 2 switched to datafile copy
input datafile copy RECID=4 STAMP=933824671 file
name=/home/oracle/oradata/STBDB/sysaux01.dbf

datafile 3 switched to datafile copy
input datafile copy RECID=5 STAMP=933824671 file
name=/home/oracle/oradata/STBDB/undotbs01.dbf

datafile 4 switched to datafile copy
input datafile copy RECID=6 STAMP=933824671 file
name=/home/oracle/oradata/STBDB/users01.dbf

Finished Duplicate Db at 20-JAN-17

RMAN>

```

Connect to cloud database and query V\$DATABASE view:

```

SQL> select name, db_unique_name, database_role, switchover_status from
v$database;

```

NAME	DB_UNIQUE_NAME	DATABASE_ROLE	SWITCHOVER_STATUS
PROD	STBDB	PHYSICAL STANDBY TO PRIMARY	

```

SQL>

```

Make sure you set LOG_ARCHIVE_DEST_2 parameter on the on-premises database and specify the instance running on the cloud machine:

```
SQL> ALTER SYSTEM SET log_archive_dest_2='SERVICE=STBDB ASYNC
VALID_FOR=(ONLINE_LOGFILES,PRIMARY_ROLE) DB_UNIQUE_NAME=STBDB';

System altered.

SQL>
```

No switch to the cloud machine and start the apply process:

```
SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT;

Database altered.

SQL>
```

Ok, the standby database is ready. Perform some logfile switches, create a new table and switch log file again. Move the standby machine and check alert.log file to see if log files are moved and applied to the standby database.

```
SQL> alter system switch logfile;

System altered.
```

```
SQL> create table mytable as select * from dba_objects where rownum<=100;

Table created.
```

```
SQL> alter system switch logfile;

System altered.

SQL>
```

Next, open the standby database in the read only mode and see if you can query the table created on on-premises database:

```
SQL> alter database recover managed standby database cancel;
```


Database altered.

```
SQL> alter database open read only;
```

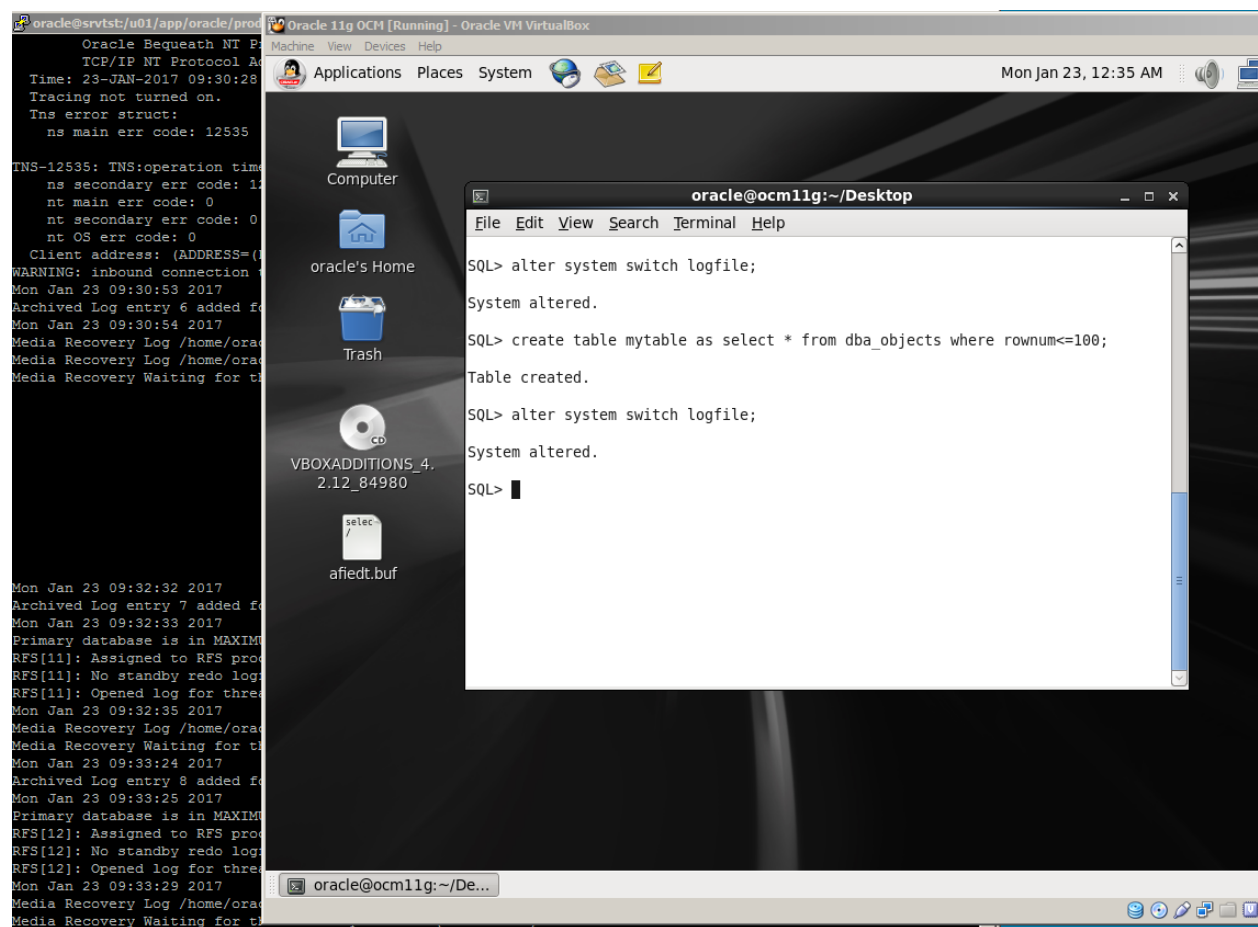
Database altered.

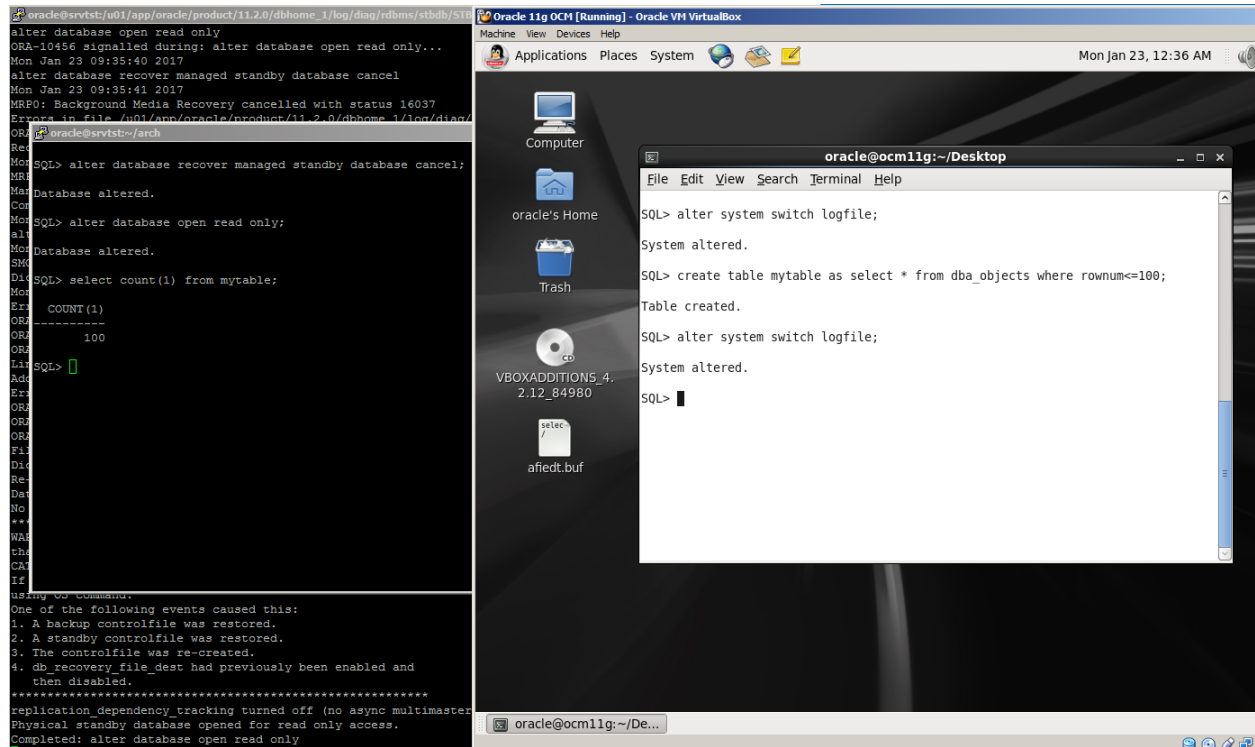
```
SQL> select count(1) from mytable;
```

```
COUNT(1)
```

```
100
```

```
SQL>
```





As you see, the table has been moved within archived log file to the cloud machine and applied to the standby instance.

Performing disaster recovery with RMAN in Oracle Cloud using On-Premises backup stored in Oracle Cloud Backup Storage

In the previous blog posts you have seen how to create a disaster recovery for on-premises Oracle Database by creating a standby database in Oracle Cloud. Sometimes, you might not need to create a standby database, but just store the backup of your database in Oracle Cloud Storage and then use it to create a database in the cloud in the future. In this blog post I will show you how to take backup of on-premises database to Oracle Cloud Storage and use it to perform a disaster recovery by restoring/recovering from backup to the instance in the cloud and perform recovery of on-premises database using backups stored in the cloud storage using RMAN.

First of all, we need to download and install a backup model to on-premises db. Open the following link and download Oracle Database Cloud Backup Module :

<http://www.oracle.com/technetwork/database/availability/oracle-cloud-backup-2162729.html>

Create folder to store wallets and lib file, extract the zip file and install it:

```
[oracle@ocm11g ~]$ mkdir wallet lib

[oracle@ocm11g tmp]$ java -jar opc_install.jar -serviceName Storage -
identityDomain yourIdentityDomain -opcID YourOpcId -opcPass YourOpcPassword -
walletDir /home/oracle/wallet -libDir /home/oracle/lib

Oracle Database Cloud Backup Module Install Tool, build 2016-10-07

Oracle Database Cloud Backup Module credentials are valid.

Oracle Database Cloud Backup Module wallet created in directory
/home/oracle/wallet.

Oracle Database Cloud Backup Module initialization file
/u03/oracle/product/11.2.4/db_1/dbs/opcPROD.ora created.

Downloading Oracle Database Cloud Backup Module Software Library from file
opc_linux64.zip.

Downloaded 26528348 bytes in 12 seconds. Transfer rate was 2210695
bytes/second.

Download complete.

[oracle@ocm11g tmp]$
```

The name of on-premises database is PROD. Now connect to RMAN and change the following configurations. Configure the channel to use SBT library which enable to store backups to the cloud (libopc.so) and provide OPC_FILE destination that contains Oracle Backup Cloud Service container URL:

```
RMAN> CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' PARMS
'SBT_LIBRARY=/home/oracle/lib/libopc.so
ENV=(OPC_PFILE=/u03/oracle/product/11.2.4/db_1/dbs/opcPROD.ora)';
```

new RMAN configuration parameters:

```
CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' PARMS
'SBT_LIBRARY=/home/oracle/lib/libopc.so
ENV=(OPC_PFILE=/u03/oracle/product/11.2.4/db_1/dbs/opcPROD.ora)';
```

new RMAN configuration parameters are successfully stored

Enable autobackup of controlfile:

```
RMAN> CONFIGURE CONTROLFILE AUTOBACKUP ON;
```

new RMAN configuration parameters:

```
CONFIGURE CONTROLFILE AUTOBACKUP ON;
```

new RMAN configuration parameters are successfully stored

Set the high compression for backups to consume less space in the cloud storage:

```
RMAN> CONFIGURE COMPRESSION ALGORITHM 'HIGH';
```

new RMAN configuration parameters:

```
CONFIGURE COMPRESSION ALGORITHM 'HIGH' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR
LOAD TRUE;
```

new RMAN configuration parameters are successfully stored

Change the default channel to tape (media -> Oracle Cloud Backup Storage)

```
RMAN> CONFIGURE DEFAULT DEVICE TYPE TO 'SBT_TAPE';
```

new RMAN configuration parameters:

```
CONFIGURE DEFAULT DEVICE TYPE TO 'SBT_TAPE';  
new RMAN configuration parameters are successfully stored
```

```
RMAN>
```

Now connect to RMAN and run SHOW ALL command to see the backup configurations:

```
[oracle@ocml1g ~]$ rman target /
```

```
RMAN> show all;  
using target database control file instead of recovery catalog  
RMAN configuration parameters for database with db_unique_name PROD are:  
CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default  
CONFIGURE BACKUP OPTIMIZATION OFF; # default  
CONFIGURE DEFAULT DEVICE TYPE TO 'SBT_TAPE';  
CONFIGURE CONTROLFILE AUTOBACKUP ON;  
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE SBT_TAPE TO '%F'; #  
default  
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; #  
default  
CONFIGURE DEVICE TYPE SBT_TAPE PARALLELISM 1 BACKUP TYPE TO BACKUPSET; #  
default  
CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default  
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE SBT_TAPE TO 1; # default  
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default  
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE SBT_TAPE TO 1; # default  
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default  
CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' PARMS  
'SBT_LIBRARY=/home/oracle/lib/libopc.so  
ENV=(OPC_PFILE=/u03/oracle/product/11.2.4/db_1/dbs/opcPROD.ora)';  
CONFIGURE MAXSETSIZE TO UNLIMITED; # default  
CONFIGURE ENCRYPTION FOR DATABASE OFF; # default  
CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default  
CONFIGURE COMPRESSION ALGORITHM 'HIGH' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR  
LOAD TRUE;
```

```
CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default
CONFIGURE SNAPSHOT CONTROLFILE NAME TO
'/u03/oracle/product/11.2.4/db_1/dbs/snapcf_PROD.f'; # default
```

Before taking the backup, create a table at on-premises database. We will query it after disaster recovery in the cloud db.

```
SQL> create table mytable as select * from dba_objects where rownum<=100;
Table created.
```

```
SQL> select count(1) from mytable;
```

```
      COUNT(1)
-----
          100
```

```
SQL>
```

Now enable encryption (set the password for backups) and take backup of the database:

```
RMAN> set encryption on identified by "mypass" only;
executing command: SET encryption
```

```
RMAN> backup database plus archivelog;
Starting backup at 10-FEB-17
current log archived
allocated channel: ORA_SBT_TAPE_1
channel ORA_SBT_TAPE_1: SID=33 device type=SBT_TAPE
channel ORA_SBT_TAPE_1: Oracle Database Backup Service Library VER=3.16.9.21
channel ORA_SBT_TAPE_1: starting archived log backup set
channel ORA_SBT_TAPE_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=48 RECID=71 STAMP=935603816
channel ORA_SBT_TAPE_1: starting piece 1 at 10-FEB-17
channel ORA_SBT_TAPE_1: finished piece 1 at 10-FEB-17
```

piece handle=17rs8bjd_1_1 tag=TAG20170210T175700 comment=API Version 2.0,MMS
Version 3.16.9.21

channel ORA_SBT_TAPE_1: backup set complete, elapsed time: 00:00:25

Finished backup at 10-FEB-17

Starting backup at 10-FEB-17

using channel ORA_SBT_TAPE_1

channel ORA_SBT_TAPE_1: starting full datafile backup set

channel ORA_SBT_TAPE_1: specifying datafile(s) in backup set

input datafile file number=00001 name=/u03/oracle/oradata/PROD/system01.dbf

input datafile file number=00002 name=/u03/oracle/oradata/PROD/sysaux01.dbf

input datafile file number=00003 name=/u03/oracle/oradata/PROD/undotbs01.dbf

input datafile file number=00004 name=/u03/oracle/oradata/PROD/users01.dbf

channel ORA_SBT_TAPE_1: starting piece 1 at 10-FEB-17

channel ORA_SBT_TAPE_1: finished piece 1 at 10-FEB-17

piece handle=18rs8bk6_1_1 tag=TAG20170210T175726 comment=API Version 2.0,MMS
Version 3.16.9.21

channel ORA_SBT_TAPE_1: backup set complete, elapsed time: 02:57:07

Finished backup at 10-FEB-17

Starting backup at 10-FEB-17

current log archived

using channel ORA_SBT_TAPE_1

channel ORA_SBT_TAPE_1: starting archived log backup set

channel ORA_SBT_TAPE_1: specifying archived log(s) in backup set

input archived log thread=1 sequence=49 RECID=72 STAMP=935605482

input archived log thread=1 sequence=50 RECID=73 STAMP=935614475

channel ORA_SBT_TAPE_1: starting piece 1 at 10-FEB-17

channel ORA_SBT_TAPE_1: finished piece 1 at 10-FEB-17

piece handle=1ars8m0c_1_1 tag=TAG20170210T205435 comment=API Version 2.0,MMS
Version 3.16.9.21

channel ORA_SBT_TAPE_1: backup set complete, elapsed time: 00:09:25

Finished backup at 10-FEB-17

Starting Control File and SPFILE Autobackup at 10-FEB-17

piece handle=c-345613202-20170210-02 comment=API Version 2.0,MMS Version 3.16.9.21

Finished Control File and SPFILE Autobackup at 10-FEB-17

RMAN>

The backup command completed successfully and all backups are stored in Oracle Cloud Backup Storage.

Now let's perform a disaster recovery in the cloud machine. Create a new cloud database instance, configure SSH connection from on-premises to the cloud host. Copy opc_install.zip file you have downloaded from OTN to the cloud host and install it as you did it at on-premises host. Drop the database if there's any, connect to RMAN and start it in NOMOUNT mode. Provide the RMAN password, allocate a channel as you did at on-premises database and restore the spfile:

RMAN> STARTUP NOMOUNT;

RMAN> set decryption identified by "mypass";

executing command: SET decryption

using target database control file instead of recovery catalog

RMAN> run

2> {

3> allocate channel t1 type 'SBT_TAPE' PARMS
'SBT_LIBRARY=/home/oracle/lib/libopc.so
ENV=(OPC_PFILE=/u01/app/oracle/product/11.2.0/dbhome_1/dbs/opcPROD.ora) ';

4> set dbid=345613202;

5> restore spfile to pfile '/tmp/pfile.ora' from autobackup;

6> }

allocated channel: t1

channel t1: SID=171 device type=SBT_TAPE

channel t1: Oracle Database Backup Service Library VER=3.16.9.21

executing command: SET DBID

Starting restore at 11-FEB-17

channel t1: looking for AUTOBACKUP on day: 20170211

channel t1: looking for AUTOBACKUP on day: 20170210

channel t1: AUTOBACKUP found: c-345613202-20170210-02

channel t1: restoring spfile from AUTOBACKUP c-345613202-20170210-02

channel t1: SPFILE restore from AUTOBACKUP complete

Finished restore at 11-FEB-17

released channel: t1

RMAN>

Server parameter file is restored. If you need to specify different location for some parameters, create a readable parameter file from it, make your changes, create a server parameter file from it and start the database in NOMOUNT mode using the restored (and modified) spfile.

SQL> startup nomount force;

ORACLE instance started.

Total System Global Area 1235959808 bytes

Fixed Size 2252784 bytes

Variable Size 385875984 bytes

Database Buffers 838860800 bytes

Redo Buffers 8970240 bytes

SQL> exit

Now restore controlfile from autobackup:

```
RMAN> set decryption identified by "mypass";
executing command: SET decryption

RMAN> run

2> {

3> allocate channel t1 type 'SBT_TAPE' PARMS
'SBT_LIBRARY=/home/oracle/lib/libopc.so
ENV=(OPC_PFILE=/u01/app/oracle/product/11.2.0/dbhome_1/dbs/opcPROD.ora) ';

4> set dbid=345613202;

5> restore controlfile from autobackup;

6> }

allocated channel: t1
channel t1: SID=134 device type=SBT_TAPE
channel t1: Oracle Database Backup Service Library VER=3.16.9.21

executing command: SET DBID

Starting restore at 11-FEB-17

channel t1: looking for AUTOBACKUP on day: 20170211
channel t1: looking for AUTOBACKUP on day: 20170210
channel t1: AUTOBACKUP found: c-345613202-20170210-02
channel t1: restoring control file from AUTOBACKUP c-345613202-20170210-02
channel t1: control file restore from AUTOBACKUP complete
output file name=/u04/app/oracle/oradata/control01.ctl
output file name=/u04/app/oracle/oradata/control02.ctl
Finished restore at 11-FEB-17
released channel: t1

RMAN>
```

Controlfile are restored. Start the database in MOUNT mode and restore the datafiles. Specify a new folder using SET NEWNAME FOR DATABASE TO command as follows:

```
RMAN> run  
2> {  
3> allocate channel t1 type 'SBT_TAPE' PARMS  
'SBT_LIBRARY=/home/oracle/lib/libopc.so  
ENV=(OPC_PFILE=/u01/app/oracle/product/11.2.0/dbhome_1/dbs/opcPROD.ora)';  
4> set newname for database to '/u04/app/oracle/oradata/%U.dbf';  
5> restore database;  
6> switch datafile all;  
7> }
```

```
allocated channel: t1  
channel t1: SID=133 device type=SBT_TAPE  
channel t1: Oracle Database Backup Service Library VER=3.16.9.21
```

```
executing command: SET NEWNAME
```

```
Starting restore at 11-FEB-17  
Starting implicit crosscheck backup at 11-FEB-17  
Crosschecked 1 objects  
Finished implicit crosscheck backup at 11-FEB-17
```

```
Starting implicit crosscheck copy at 11-FEB-17  
Crosschecked 2 objects  
Finished implicit crosscheck copy at 11-FEB-17
```

```
searching for all files in the recovery area  
cataloging files...  
no files cataloged
```

```
channel t1: starting datafile backup set restore
channel t1: specifying datafile(s) to restore from backup set
channel t1: restoring datafile 00001 to /u04/app/oracle/oradata/data_D-
PROD_TS-SYSTEM_FNO-1.dbf
channel t1: restoring datafile 00002 to /u04/app/oracle/oradata/data_D-
PROD_TS-SYSAUX_FNO-2.dbf
channel t1: restoring datafile 00003 to /u04/app/oracle/oradata/data_D-
PROD_TS-UNDOTBS1_FNO-3.dbf
channel t1: restoring datafile 00004 to /u04/app/oracle/oradata/data_D-
PROD_TS-USERS_FNO-4.dbf
channel t1: reading from backup piece 18rs8bk6_1_1
channel t1: piece handle=18rs8bk6_1_1 tag=TAG20170210T175726
channel t1: restored backup piece 1
channel t1: restore complete, elapsed time: 00:00:45
Finished restore at 11-FEB-17
```

```
datafile 1 switched to datafile copy
input datafile copy RECID=14 STAMP=935693831 file
name=/u04/app/oracle/oradata/data_D-PROD_TS-SYSTEM_FNO-1.dbf
datafile 2 switched to datafile copy
input datafile copy RECID=15 STAMP=935693831 file
name=/u04/app/oracle/oradata/data_D-PROD_TS-SYSAUX_FNO-2.dbf
datafile 3 switched to datafile copy
input datafile copy RECID=16 STAMP=935693831 file
name=/u04/app/oracle/oradata/data_D-PROD_TS-UNDOTBS1_FNO-3.dbf
datafile 4 switched to datafile copy
input datafile copy RECID=17 STAMP=935693831 file
name=/u04/app/oracle/oradata/data_D-PROD_TS-USERS_FNO-4.dbf
released channel: t1
```

```
RMAN>
```

Now run ALTER DATABASE RENAME FILE command to rename redo log files:

```
SQL> alter database rename file '/u03/oracle/oradata/PROD/redo03.log' to  
'/u04/app/oracle/oradata/redo03.log';
```

Database altered.

```
SQL> alter database rename file '/u03/oracle/oradata/PROD/redo02.log' to  
'/u04/app/oracle/oradata/redo02.log';
```

Database altered.

```
SQL> alter database rename file '/u03/oracle/oradata/PROD/redo01.log' to  
'/u04/app/oracle/oradata/redo01.log';
```

Database altered.

```
SQL>
```

Now run RECOVER DATABASE command to recover the database and open the database:

```
RMAN> set decryption identified by "mypass";
```

executing command: SET decryption

```
RMAN> run
```

```
2> {
```

```
3> allocate channel t1 type 'SBT_TAPE' PARMS  
'SBT_LIBRARY=/home/oracle/lib/libopc.so  
ENV=(OPC_PFILE=/u01/app/oracle/product/11.2.0/dbhome_1/dbs/opcPROD.ora)';
```

```
4> recover database;
```

```
5> }
```

allocated channel: t1

channel t1: SID=125 device type=SBT_TAPE

channel t1: Oracle Database Backup Service Library VER=3.16.9.21

Starting recover at 11-FEB-17

starting media recovery

```

channel t1: starting archived log restore to default destination
channel t1: restoring archived log
archived log thread=1 sequence=49
channel t1: restoring archived log
archived log thread=1 sequence=50
channel t1: reading from backup piece lars8m0c_1_1
channel t1: piece handle=lars8m0c_1_1 tag=TAG20170210T205435
channel t1: restored backup piece 1
channel t1: restore complete, elapsed time: 00:00:07

archived log file
name=/u03/app/oracle/fast_recovery_area/PROD/archivelog/2017_02_11/o1_mf_1_49
_d9yqs878_.arc thread=1 sequence=49
channel default: deleting archived log(s)

archived log file
name=/u03/app/oracle/fast_recovery_area/PROD/archivelog/2017_02_11/o1_mf_1_49
_d9yqs878_.arc RECID=75 STAMP=935693995

archived log file
name=/u03/app/oracle/fast_recovery_area/PROD/archivelog/2017_02_11/o1_mf_1_50
_d9yqs8cn_.arc thread=1 sequence=50
channel default: deleting archived log(s)

archived log file
name=/u03/app/oracle/fast_recovery_area/PROD/archivelog/2017_02_11/o1_mf_1_50
_d9yqs8cn_.arc RECID=74 STAMP=935693994

unable to find archived log
archived log thread=1 sequence=51
released channel: t1

RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====

RMAN-03002: failure of recover command at 02/11/2017 19:00:00

RMAN-06054: media recovery requesting unknown archived log for thread 1 with
sequence 51 and starting SCN of 1153764

RMAN> alter database open resetlogs;

database opened

```

RMAN>

Connect to SQL*Plus and query the table you have created before taking a backup at on-premises database:

```
SQL> select count(1) from mytable;
```

```
      COUNT(1)
-----
          100
```

SQL>

Great! We have successfully performed a disaster recovery of on-premises database to the cloud using RMAN backups stored in Oracle Cloud Backup Storage!

Now let's use backups stored in the cloud to perform a recovery to on-premises database. Let's create a new table, take backup of the datafile, corrupt a block of the datafile and recover it from backups stored in the cloud.

```
SQL> create table test_table tablespace users as select * from dba_objects
where rownum<=10;
```

Table created.

```
RMAN> set encryption on identified by "mypass" only;
```

executing command: SET encryption

```
RMAN> backup datafile 4;
```

Starting backup at 11-FEB-17

using channel ORA_SBT_TAPE_1

channel ORA_SBT_TAPE_1: starting full datafile backup set

channel ORA_SBT_TAPE_1: specifying datafile(s) in backup set

input datafile file number=00004 name=/u03/oracle/oradata/PROD/users01.dbf

channel ORA_SBT_TAPE_1: starting piece 1 at 11-FEB-17

```
channel ORA_SBT_TAPE_1: finished piece 1 at 11-FEB-17
piece handle=1drsaim0_1_1 tag=TAG20170211T141008 comment=API Version 2.0,MMS
Version 3.16.9.21
```

```
channel ORA_SBT_TAPE_1: backup set complete, elapsed time: 00:00:45
Finished backup at 11-FEB-17
```

```
Starting Control File and SPFILE Autobackup at 11-FEB-17
```

```
piece handle=c-345613202-20170211-00 comment=API Version 2.0,MMS Version
3.16.9.21
```

```
Finished Control File and SPFILE Autobackup at 11-FEB-17
```

```
RMAN> exit
```

```
SQL> SELECT header_block FROM dba_segments WHERE segment_name='TEST_TABLE';
```

```
HEADER_BLOCK
```

```
-----
```

```
170
```

```
SQL>
```

```
[oracle@ocm11g ~]$ dd of=/u03/oracle/oradata/PROD/users01.dbf bs=8192
conv=notrunc seek=170 <<EOF
```

```
> Corruption
```

```
> Corruption
```

```
> EOF
```

```
0+1 records in
```

```
0+1 records out
```

```
23 bytes (23 B) copied, 0.000147784 s, 156 kB/s
```

```
[oracle@ocm11g ~]$ sqlplus / as sysdba
```

```
SQL> alter system flush buffer_cache;
```

```
System altered.
```



```
SQL> select count(1) from test_table;
select count(1) from test_table
          *

ERROR at line 1:
ORA-01578: ORACLE data block corrupted (file # 4, block # 170)
ORA-01110: data file 4: '/u03/oracle/oradata/PROD/users01.dbf'
```

```
SQL> select * from v$database_block_corruption;
```

FILE#	BLOCK#	BLOCKS	CORRUPTION_CHANGE#	CORRUPTIO
4	170	1	0	CORRUPT

Ok, we have a corrupted block. Now connect to RMAN and recover it:

```
RMAN> recover datafile 4 block 170;
```

```
Starting recover at 11-FEB-17
using channel ORA_SBT_TAPE_1
using channel ORA_DISK_1
```

```
channel ORA_SBT_TAPE_1: restoring block(s)
channel ORA_SBT_TAPE_1: specifying block(s) to restore from backup set
restoring blocks of datafile 00004
channel ORA_SBT_TAPE_1: reading from backup piece 1drsaim0_1_1
channel ORA_SBT_TAPE_1: piece handle=1drsaim0_1_1 tag=TAG20170211T141008
channel ORA_SBT_TAPE_1: restored block(s) from backup piece 1
channel ORA_SBT_TAPE_1: block restore complete, elapsed time: 00:00:15
```

```
starting media recovery
```

```
media recovery complete, elapsed time: 00:00:01
```

```
Finished recover at 11-FEB-17
```

```
RMAN> exit
```

```
[oracle@ocm11g ~]$ sqlplus / as sysdba
```

```
SQL> select count(1) from test_table;
```

```
COUNT(1)
```

```
-----
```

```
10
```

```
SQL>
```

As you see, we used backups stored in Oracle Cloud Backup Storage to recover a corrupted block of on-premises database.