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CLOUD SOLUTIONS

Oracle Database Cloud Service

Database as a Service in Oracle Public Cloud

September 2015

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Oracle Database Cloud Service

Introduction

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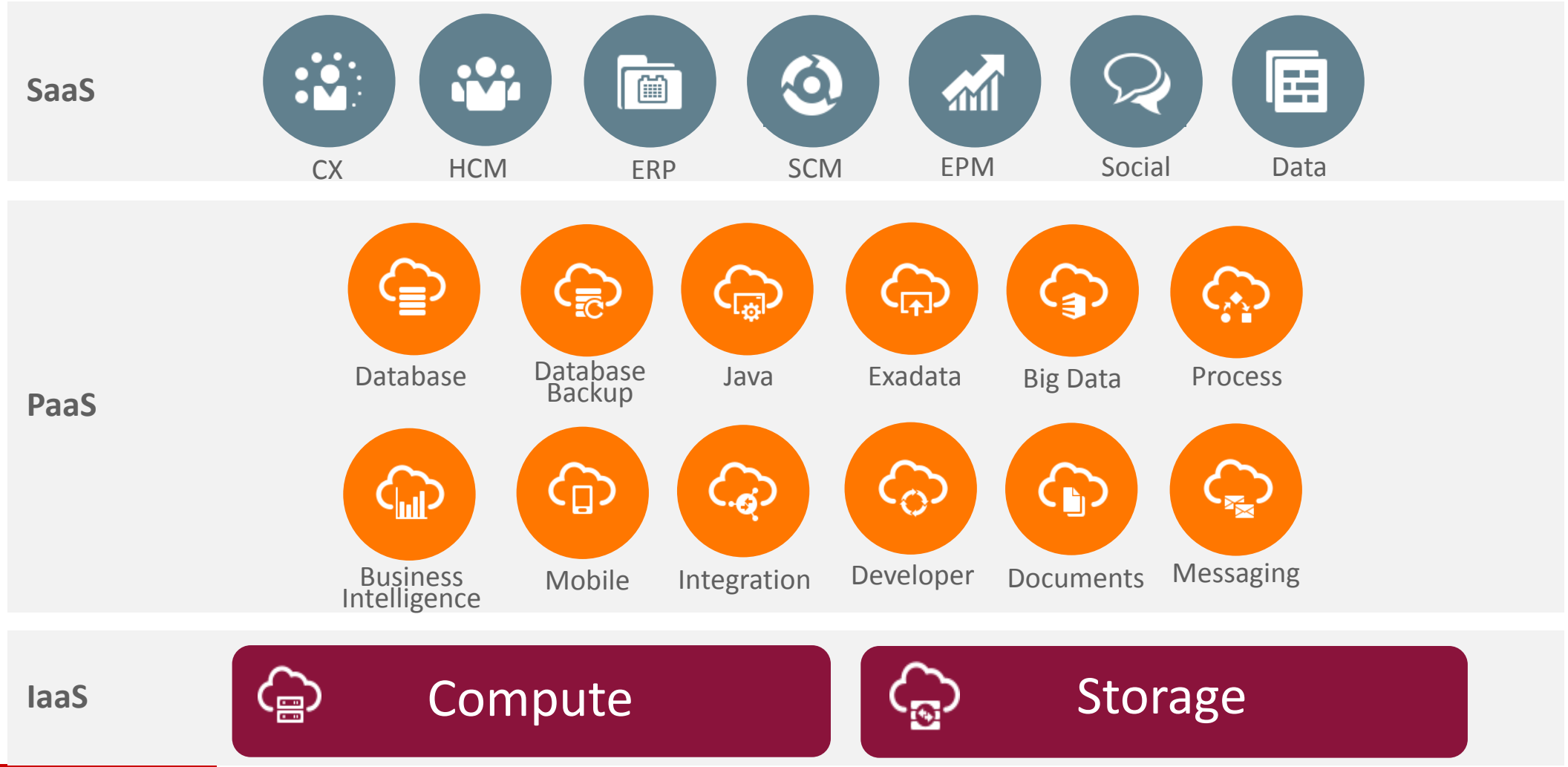
Broadest Choice



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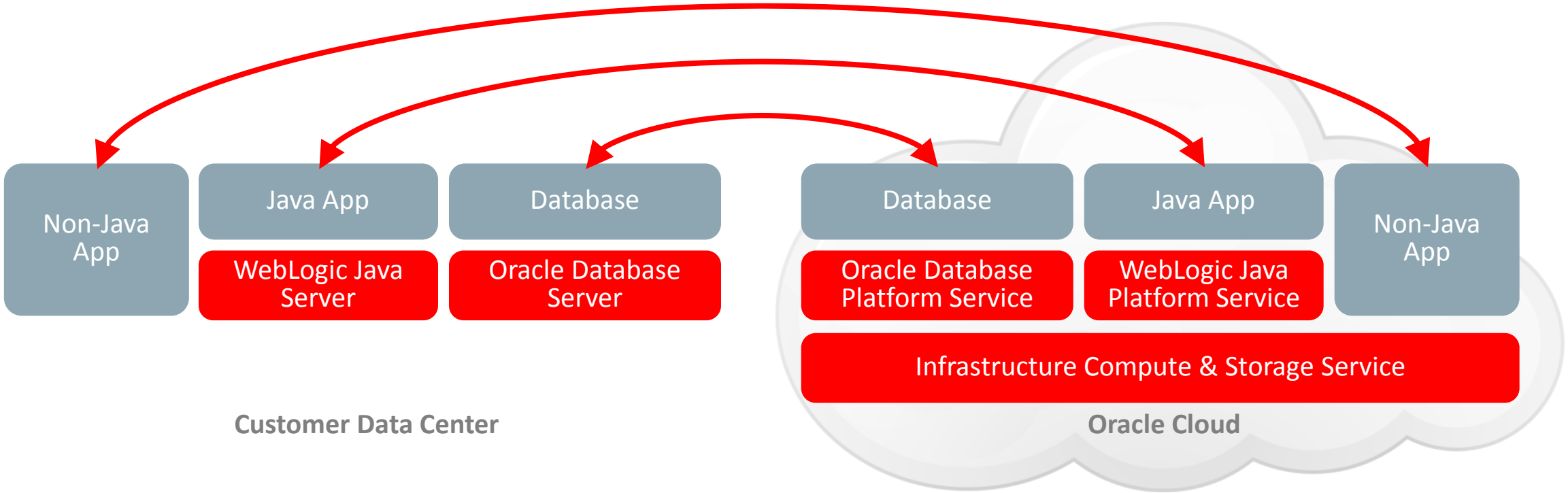
Unmatched deployment options

Move Oracle Database or Application to the Cloud

Move to Cloud – Move Back: No Code Changes!



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Customers' Challenges With Databases

Business Problem

- Rising costs
- Inefficiency, lack of agility & elisticity
- Increasing risks

Value Proposition

- Host Database and Applications in the Cloud
- Evaluate new DB features, drive DB 12c adoption
- Move test/dev environment to the Cloud
- Protect data with Backup Cloud Service

Business Benefits

- Lower cost of infrastructure purchase & setup
- Reduced operational cost thanks to elastic subscription model
- Scalable compute & storage – no HW planning headache
- No need to procure on-premise environment
- Adoption of the newest technologies (12c features)
- Reduced provisioning time to minutes (eg. 30min)
- Reduce on-premise server sprawl
- Familiar backup using simple standard RMAN commands
- Secure backup (3x mirrored) data encryption (with keys kept locally at client) in an off-premises location

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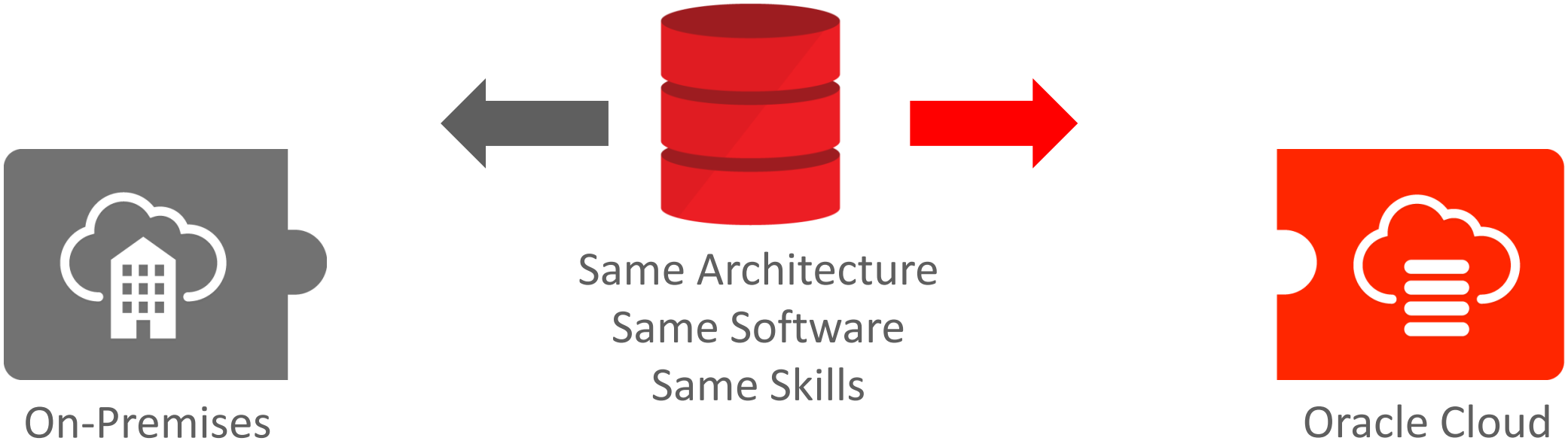
Oracle Database Cloud

Full portability between on-premises and cloud



Unified Management

Enterprise Manager manages both On Premise and Cloud*

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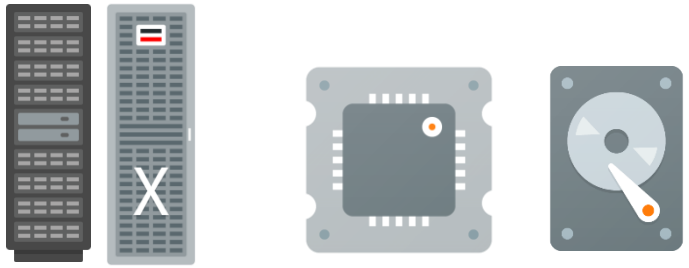
Oracle Database Cloud

Extend the enterprise data center to the cloud

On Premises

- ✓ Instantly gain access to infrastructure
- ✓ Elastic CPU and memory
- ✓ Elastic block and object storage
- ✓ Backup database to the cloud



Oracle Cloud

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Oracle Database Cloud – Management Levels Overview

Virtual Image

- Database software ready for install
- Tenant has root privilege
- Does not provide automated orchestrations
- Only available on general purpose infrastructure

Automated

- Automated install, patch, upgrade, upsize/downsize, backup/restore, recovery, data guard configuration, TDE encryption, monitoring…
- Tenant has root privilege

Managed*

- Oracle monitors and is responsible for keeping the database available
- Oracle manages install, patch, upgrade, upsize/downsize, backup/restore, recovery
- Oracle maintains privileged user access, tenant controls data.

Greater Capabilities

* Planned for a future release.

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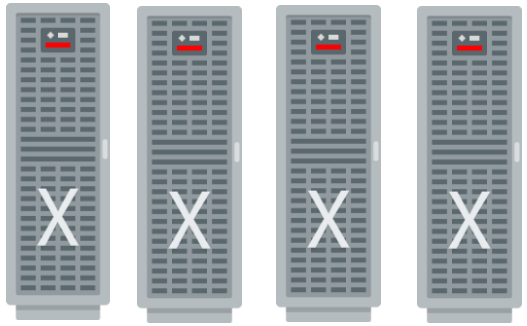
Oracle Database Cloud Service Infrastructure

General Purpose

- Test, Development, Departmental Applications
- Compute Shapes - by OCPU, Standard or High RAM
- Block Storage – by the GB
- Up to 2TB database

Engineered Systems



- Mission Critical, Intensive OLTP and Decision Support
- ¼, ½ and Full Rack Shapes
- Fixed Storage and Memory by Shape
- Up to 168TB database

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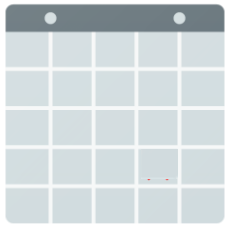
Oracle Database Cloud – Subscription Types

Un Metered

- Services available as un metered services are purchased on a term subscription basis.
- The database schema service is sold as an un metered service with terms of monthly, 1 year, 2 years and 3 years.
- Cloud credits can not be used to pay for un metered services.
- Un metered services can not be exchanged for cloud credits.



Monthly

Metered

- Cloud credits charged hourly against a rate card.
- For example an Oracle EE Extreme Performance service will burn credits faster then an Oracle SE1 database.
- Likewise a database server on 16 OCPUs (cores) will burn cloud credits faster then a 2 OCPU shape.
- Metered services are paid for in advance typically for a term of 1, 2 or 3 years.
- At the end of the term the unused credits expire.

Hourly

Greater Flexibility

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Oracle Database Cloud – Full Instance Editions

Enterprise Edition (EE)

adds…

- Transparent Data Encryption (TDE)
- All standard EE features

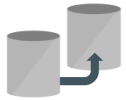
Standard Edition 1

- Full database instance
- Up to 16 OCPUs

EE High Performance

adds…

Multitenant


Data Guard

Partitioning

Advanced Compression

Advanced Security, Label Security, Database Vault

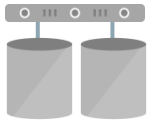
Real Application Testing

OLAP, Analytics, Spatial and Graph

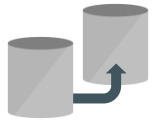
Management Packs

EE Extreme Performance

adds…


Real Application Clusters (RAC)

In Memory


Active Data Guard

Reference: http://www.oracle.com/us/products/database/enterprise-edition/comparisons/index.html

Greater Capabilities

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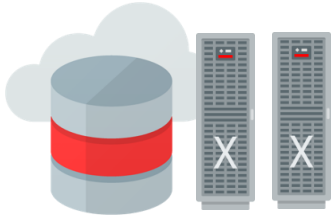
Oracle Database Cloud Services Offering

DATABASE SCHEMA SERVICE

- Fully Managed Service by Oracle
- Monthly Subscription by Database Size (5, 20, 50 GB)
- Single Database Schema, each tenant is a single schema
- Database patches and upgrades performed during scheduled maintenance windows
- Deployed on Engineered Systems, DB Edition is EE
- Data access using RESTful Web Services, no SQL*Net access
- Available since October 2013



DATABASE AS A SERVICE

- Full Database available as a metered* service (Hourly or Monthly)
- Available as a Virtual Image, Automated or Managed* Service
- Tenant controls patch and upgrade schedule
- Available on general purpose or engineered systems
- Editions: SE1, EE, EE High Performance, EE Extreme Performance
- Full root and DBA access

EXADATA SERVICE

- Deployed on Engineered Systems
- Customer can subscribe to a ¼, ½ or full Exadata rack for a monthly fee
- Mission Critical, Intensive OLTP and Decision Support
- Comes as an Extreme Performance edition - includes all DB options
- Full-featured dedicated 11gR2 or 12c multi-node RAC instance
- Capacity on Demand - start with 40% of cores per node enabled, add cores as needed
- Fixed Storage and Memory by Shape

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Oracle DATABASE AS A SERVICE

Database as a Service
Full Database Instance Service

Virtual Image

VM + DB + Disk Image

- Full distribution extracted on disk
- Same as on premise

Database Cloud Service

VM + DB + Full Provisioning

- Backup/recovery automation
- Patching and upgrade automation
- Monitoring & management portals
- Local management console

- Oracle Linux 6.4
- On-demand storage & compute
- Choice of editions SE1, EE and Database 12c 12.1.0.2, and 11g 11.2.0.4
- Bundles: EE High Performance (most options), EE Extreme Perf (all options)
- Network isolation, Full SQL*Net access
- Self-managed with SSH access into VM with root privilege

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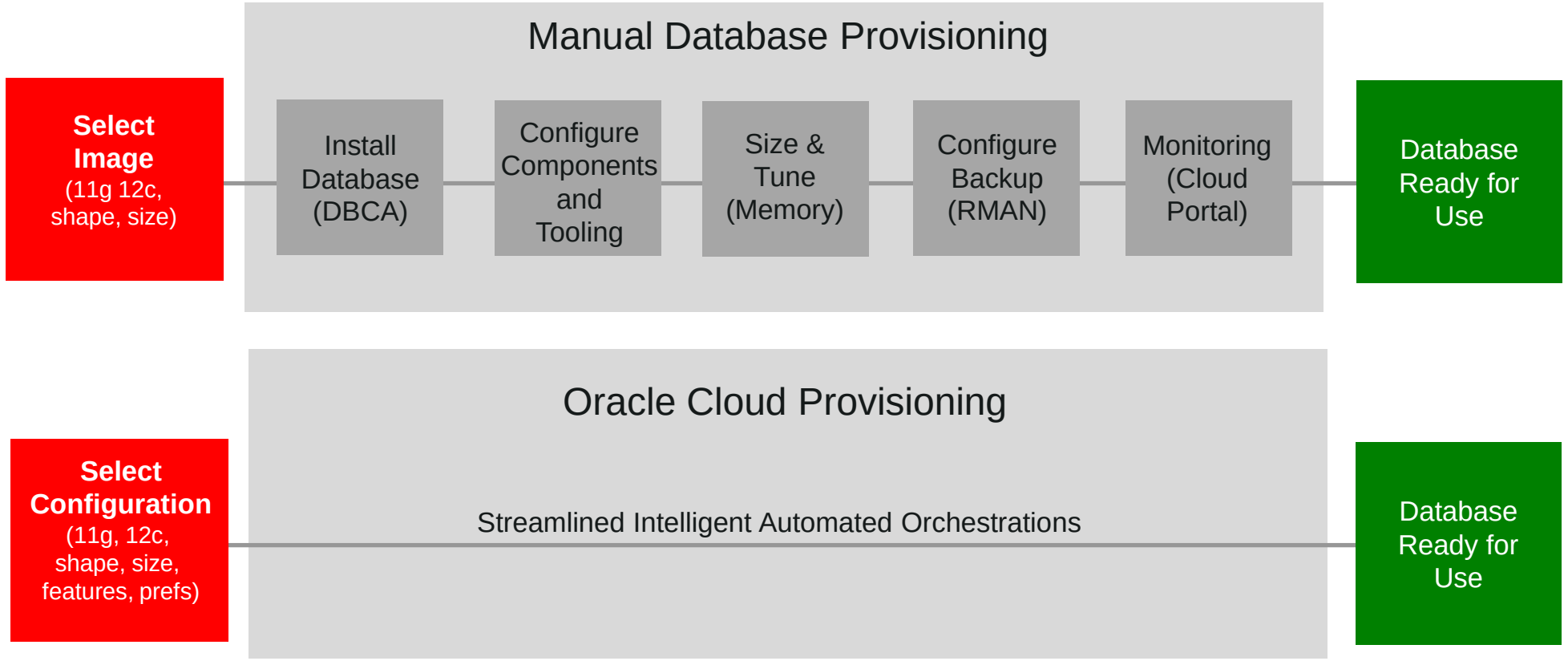
Oracle Database as a Service

Oracle Database Cloud Simplifies Database Provisioning



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Oracle Database Cloud

Oracle Database and Infrastructure On-Premise Provisioning

On-Premise

1. Procure Data Center Floor space
2. Procure Servers
3. Procure Storage Devices
4. Procure SSL Certificates & Keys
5. Procure HSM Devices (for encryption)
6. Procure OS Licenses
7. Procure Anti-Virus Licenses
8. Procure SIEM Licenses
9. Allocate Storage Admin
10. Allocate System Admin
11. Allocate Database Admin
12. Allocate Network Admin
13. Install Server
14. Cable Server to Network
15. Install SSL Certificates & Keys
16. Acquire Public/Private IP Addresses
17. Acquire Domain Name (from internal DNS)
18. Install Storage Devices
19. Acquire IP Addresses
20. Install SSL Certificates and Keys
21. Create Physical Storage Volumes
22. Register Storage Devices with Server
23. Install Operating System
24. Create System Administrator Accounts
25. Register with Corporate LDAP Directory
26. Register with Audit Software
27. Add Users to System Administration Accounts
28. Register Servers with Redhat Administrative Console
29. Install Hypervisor
30. Create Virtual LAN Partitions
31. Allocate IP Addresses (Private)
32. Carry out Network Address Translation (NAT)
33. Register Virtual LANs with Network Switch
34. Add Users to Hypervisor Administrator Accounts
35. Register Guests with VMWare ESX Console
36. Run Clusterware Pre-requisite checks
37. Run Oracle DBMS Install Pre-requisite checks
38. Read database installation guild
39. Stage Oracle Database software
40. Configure Oracle Database
41. Log in to the system as root
42. Check HW, Memory, System, Disk, software, OS, OS Kernel, package, compiler, and additional software requirements
43. Create required OS Groups and Users, Oracle Inventory group, oracle software owner, OSDBA group, OSOPER group
44. Synchronize groups with LDAP repository
45. Configure Kernel parameters and resource limits, create required directories, configure user
46. Install oracle database; select clusterware/grid installation, specify base installation pathname
47. Specify software location, choose file system or ASM, specify file location, specify ASNSNMP password, database edition, OSDBA group, global name
48. Specify database name, database name domain, administrative password, confirm password
49. Verify database is functioning properly
50. Email developers access credentials and configuration details

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Oracle Database Cloud

Oracle Database Provisioning On-premise vs in the Cloud

On-Premise

1. Procure Data Center Floor space
2. Procure Servers
3. Procure Storage Devices
4. Procure SSL Certificates & Keys
5. Procure HSM Devices (for encryption)
6. Procure OS Licenses
7. Procure Anti-Virus Licenses
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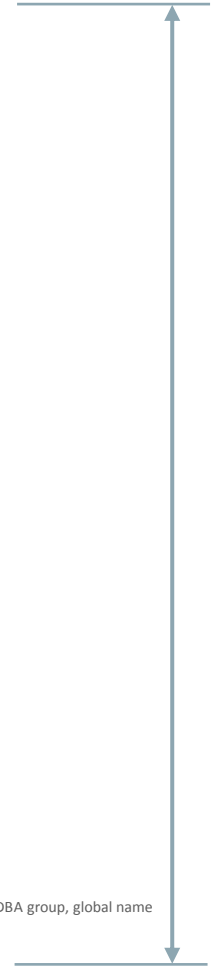
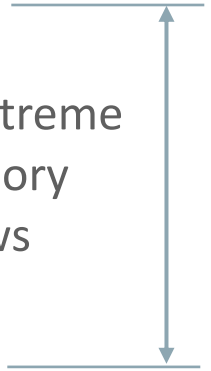


Days

Oracle Cloud

1. Choose version of DBMS
2. Choose Edition SE, EE, EE High, EE Extreme
3. Choose Shape – storage, cores, memory
4. Choose Backup and Patching windows
5. Upload Key
6. Press Go



30-60 Minutes

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Oracle Database Cloud Service

Architecture Overview

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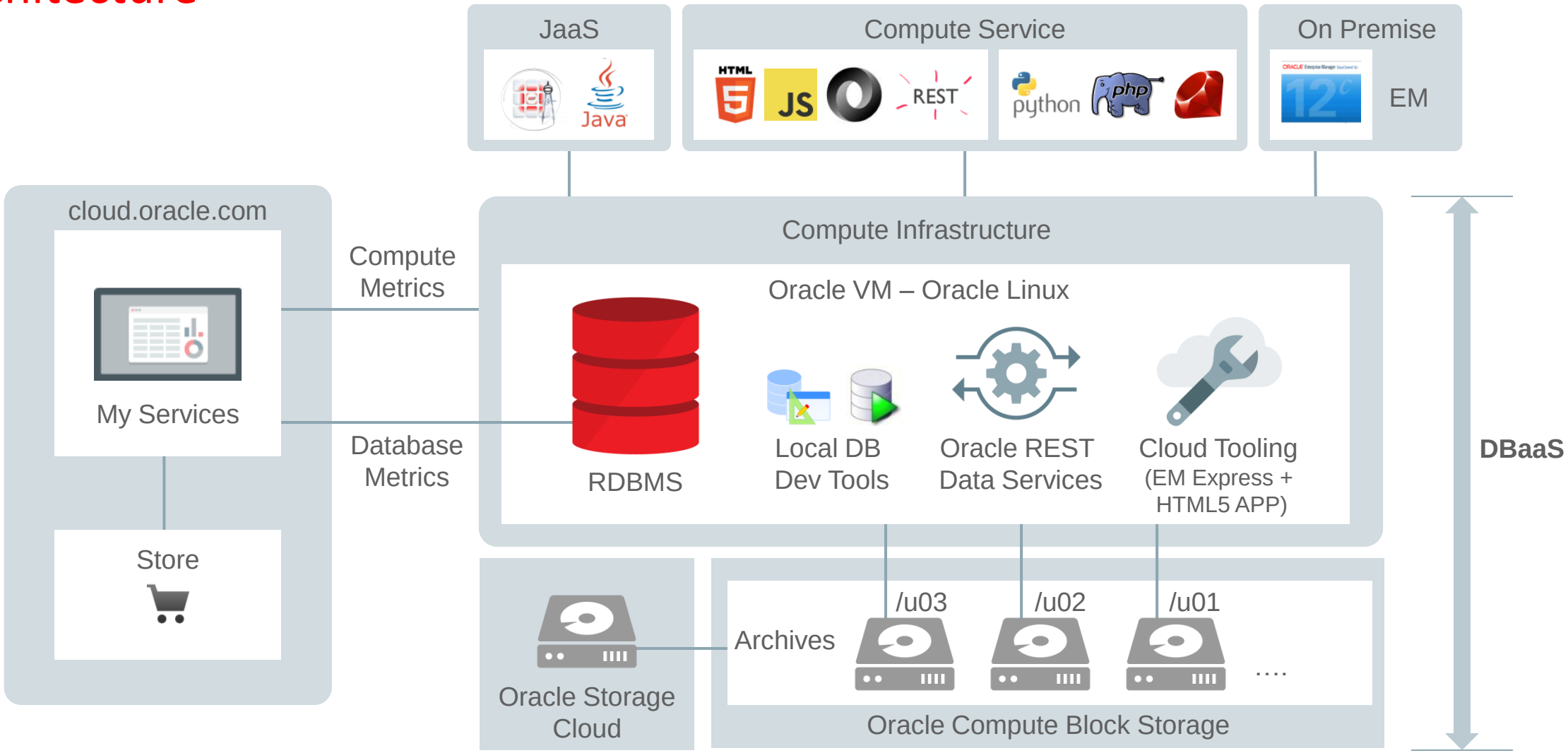
Oracle Database as a Service

Architecture



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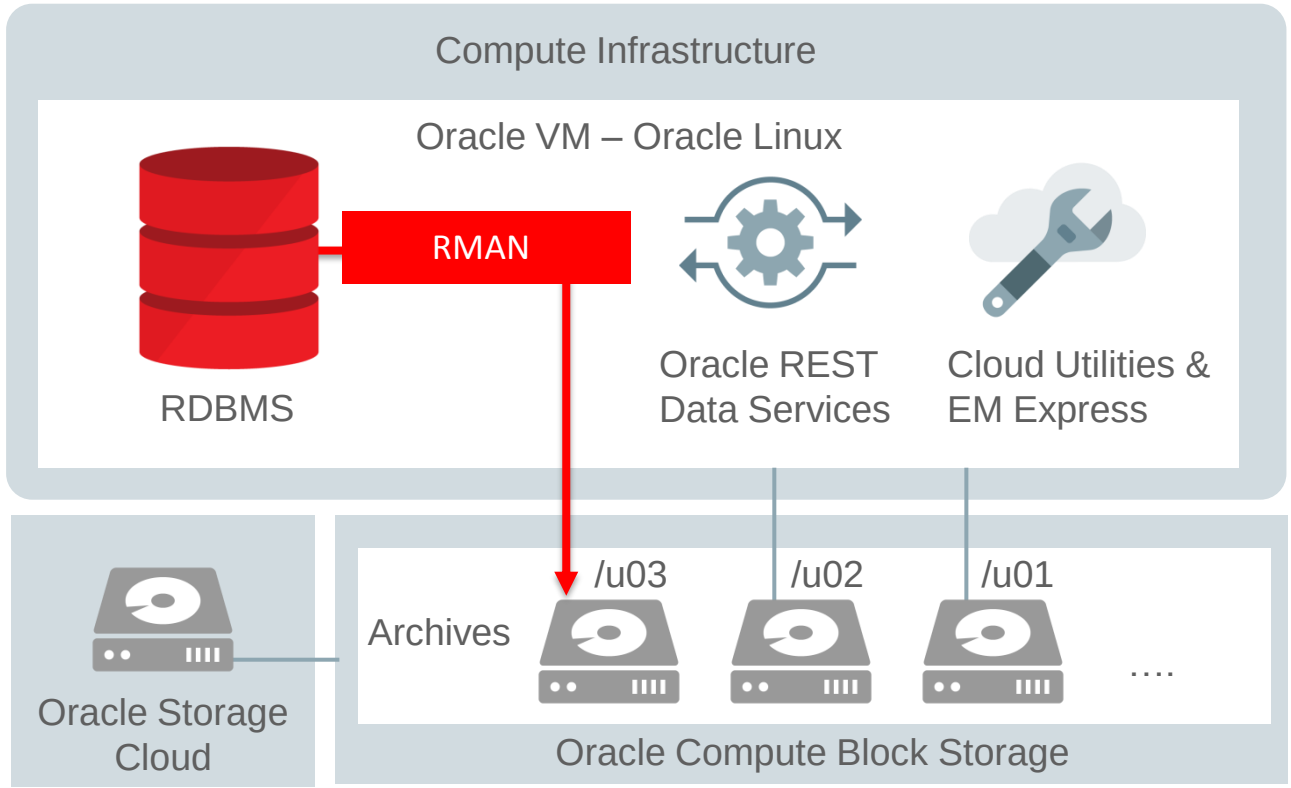
Oracle Database as a Service
Backup and Recovery



- Daily Incremental
- Weekly Full
- Older backups archived to Oracle Storage Cloud
- Backups go to /u03 Block Storage
- Recovery from backup is invoked manually if customer determines its required
- Restore to point in time is customer responsibility, use standard tools and processes

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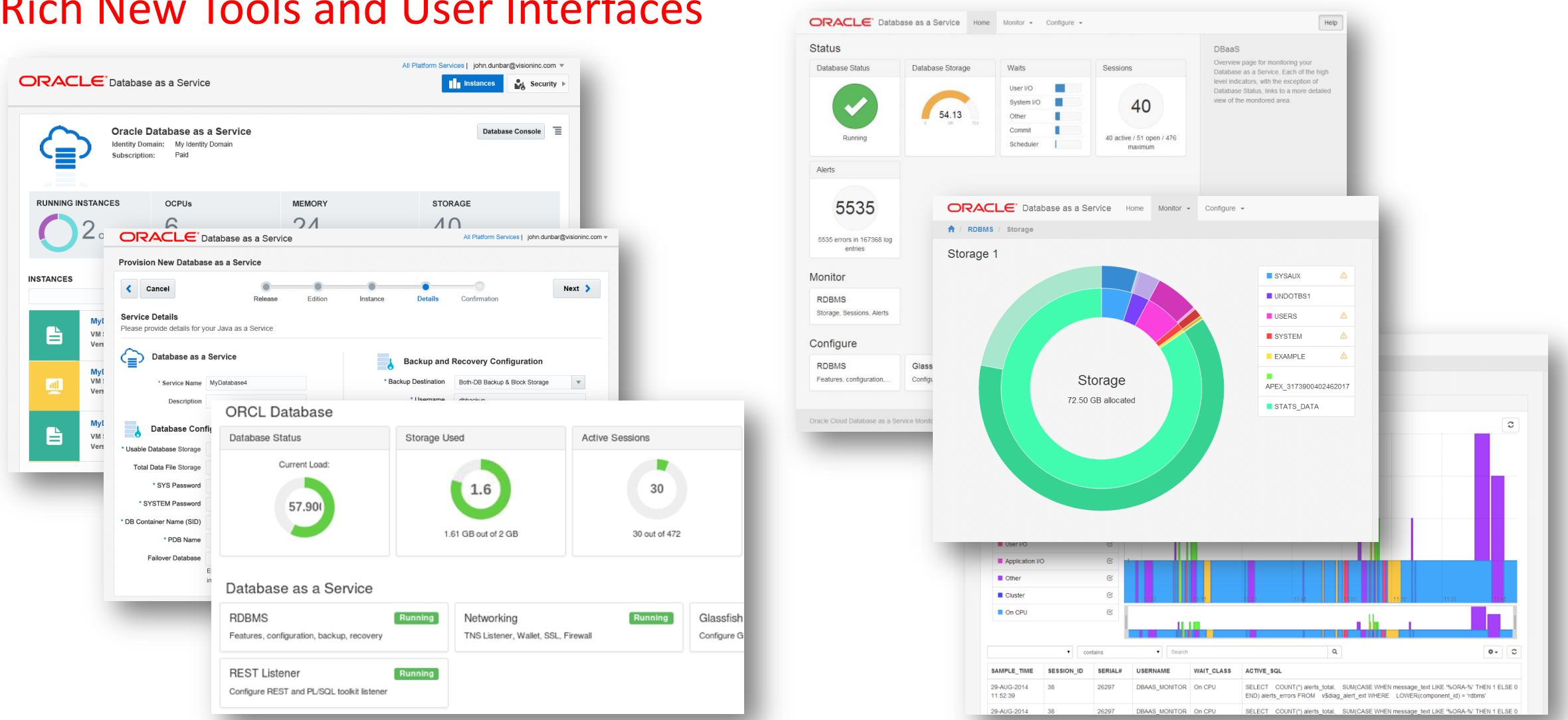
Oracle Database as a Service

Rich New Tools and User Interfaces



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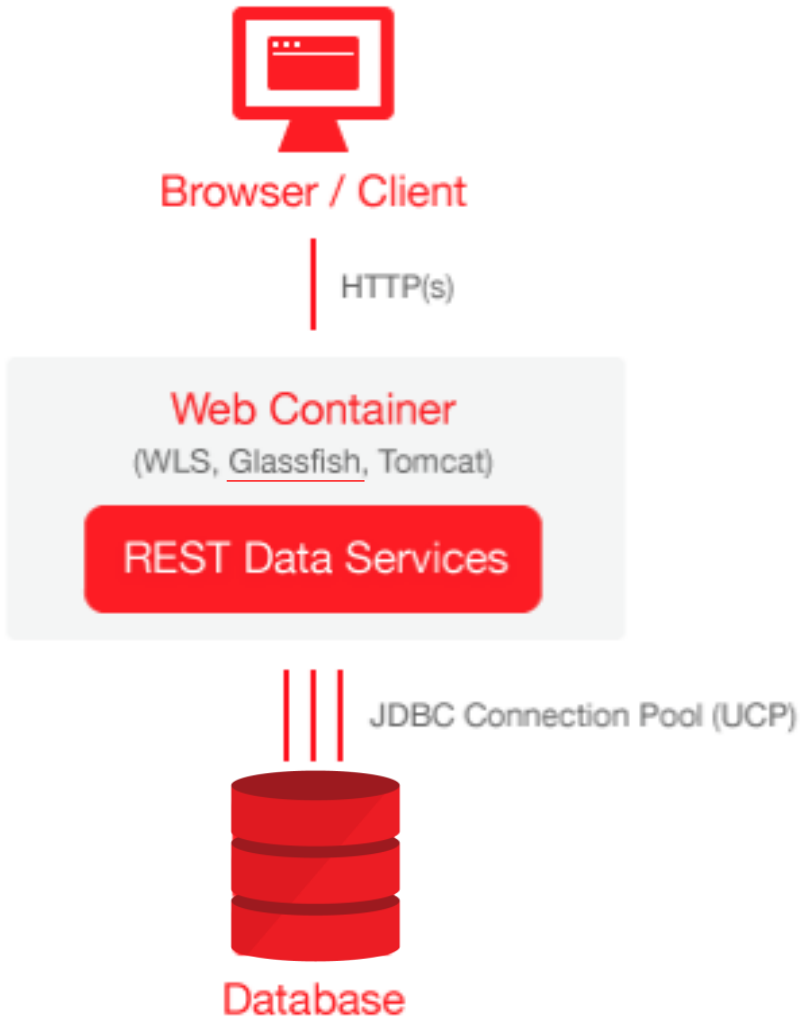
Oracle Database as a Service

Oracle REST Data Services (formerly APEX listener)

- Turns Database Service into an RESTFul API service
- Fully provisioned and functional in all cloud editions
- Available in both 11g and 12c, no extra cost
- Allows publishing of URI based access to Oracle database over REST
- Results in JSON or CSV
- Mapping of URI to SQL or PL/SQL
- All HTML methods GET, PUT, POST, DELETE, PATCH
- Oauth2 integration
- Highly scalable



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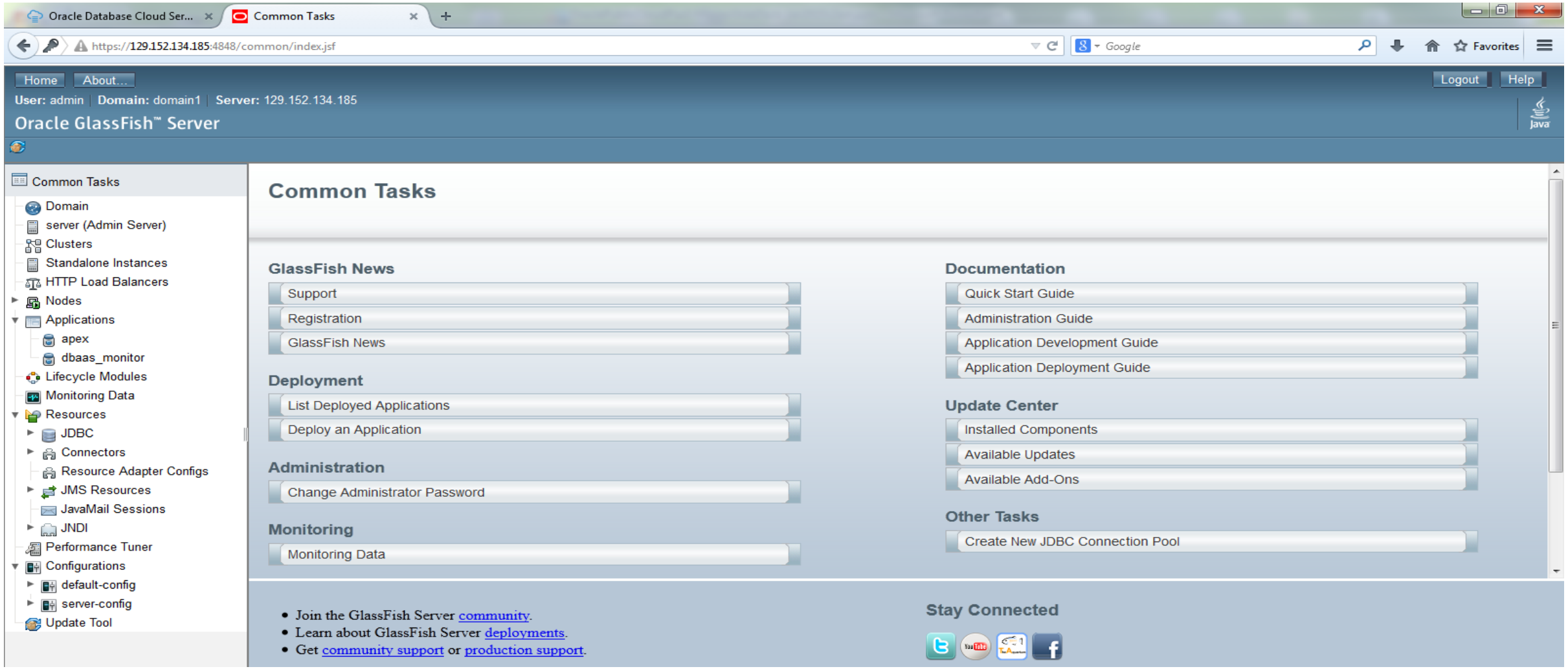
Other Tools included

GlassFish Console (support for REST Data Services)



*Firewall reconfig required to access any other protocol than SSH

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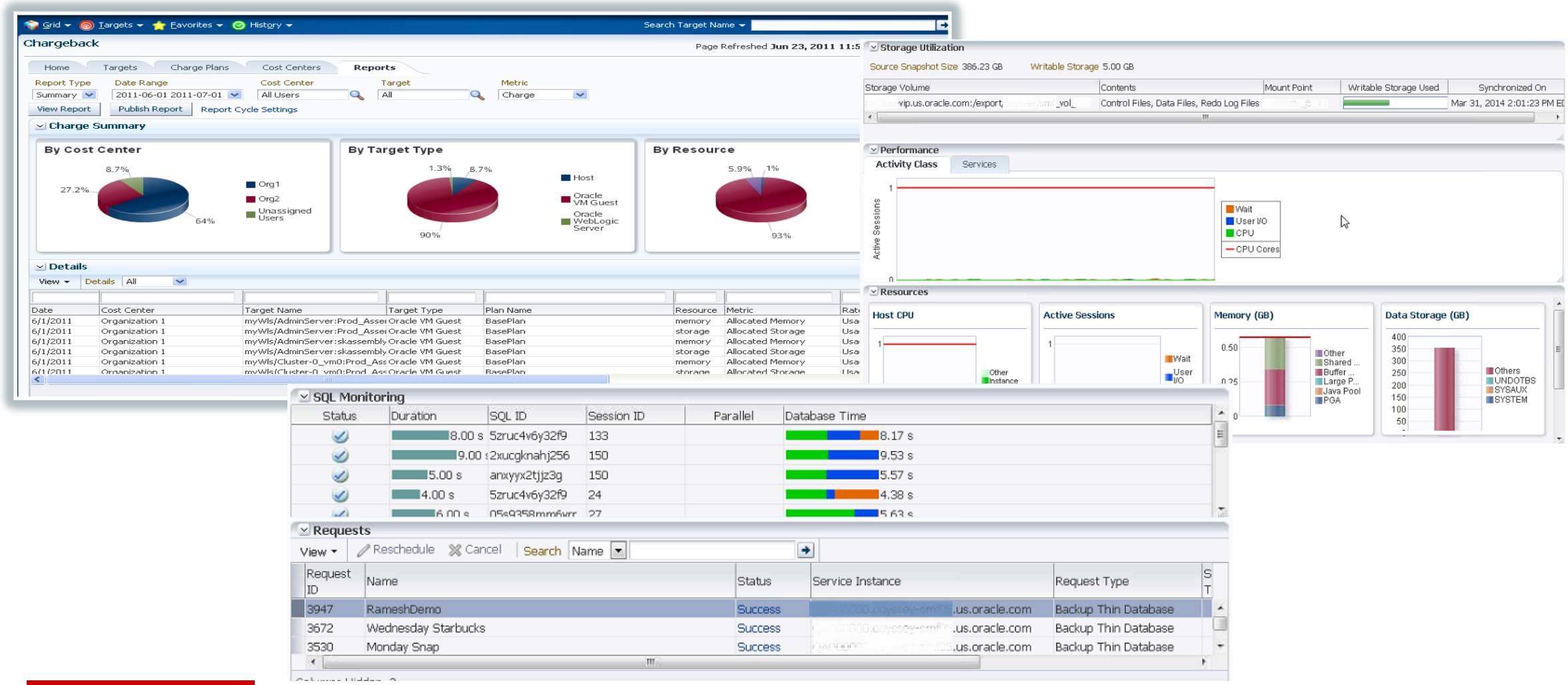
Oracle Database Cloud Service

Enterprise Manager 12c – One Console for Hybrid Management



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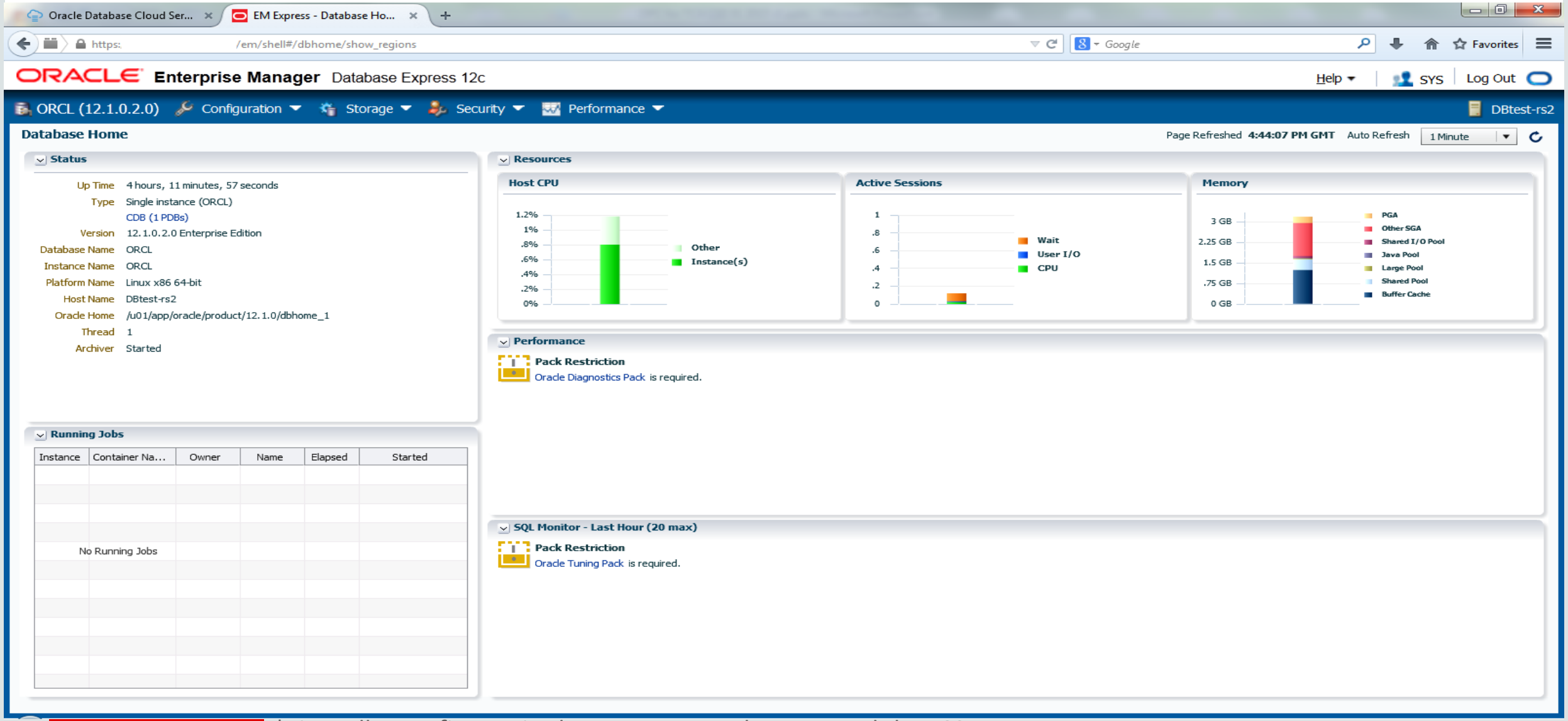
Other Tools included

EM12c Express Console



*Firewall reconfig required to access any other protocol than SSH

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Other Tools included

New DB Monitor

- HTML5 application hosted within the VM
  - Front end: JavaScript & JQuery
  - Backend: REST Listener using Glassfish
  - All communications are via REST
  - REST listener uses server side JavaScript with file system access and DB connections to display information

DBaaS Monitor - Top Features:

- Monitor database sessions, disk & CPU
- View version, features installed …
- Configure database parameters
- Initiate backups
- Bounce database
- View log and trace files

*Firewall reconfig required to access any other protocol than SSH

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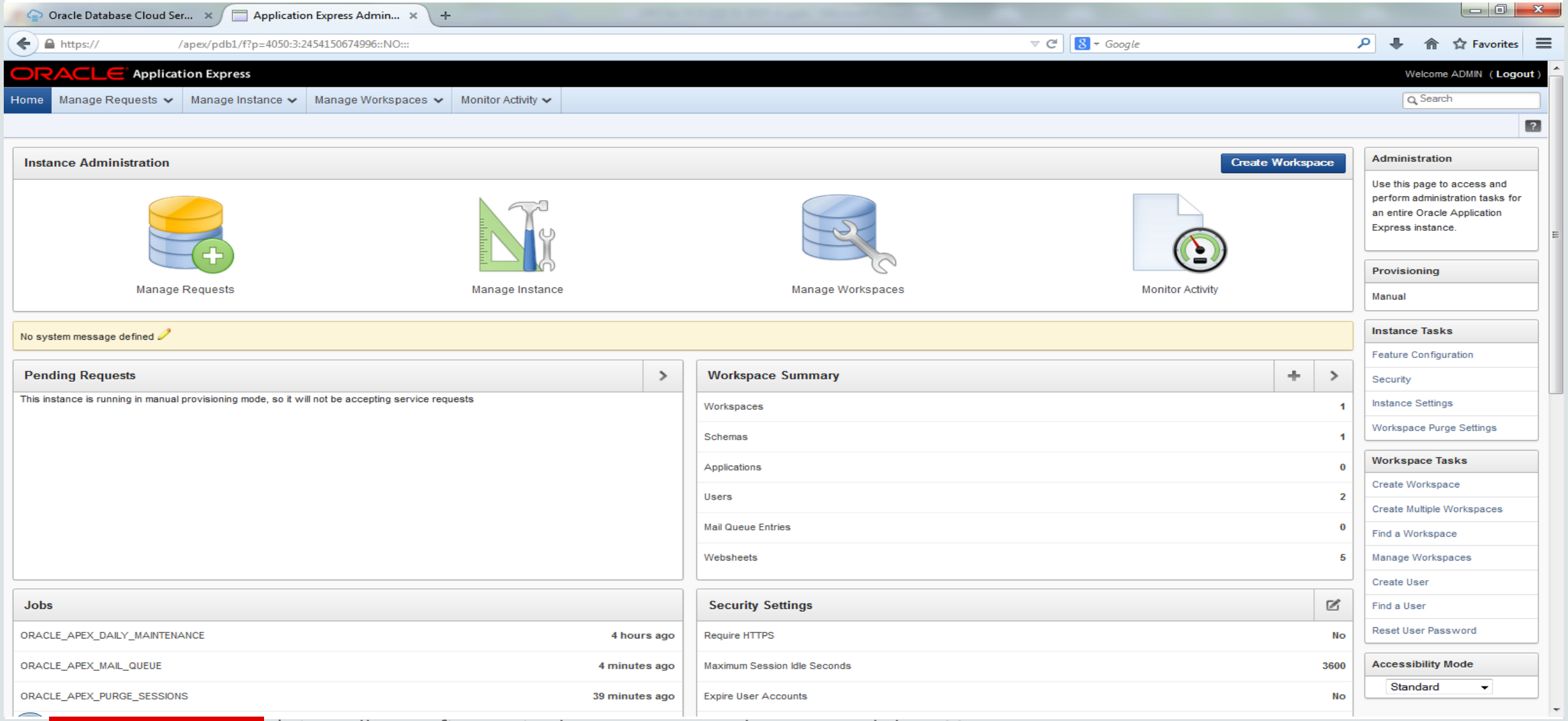
Other Tools included

APEX Console



*Firewall reconfig required to access any other protocol than SSH

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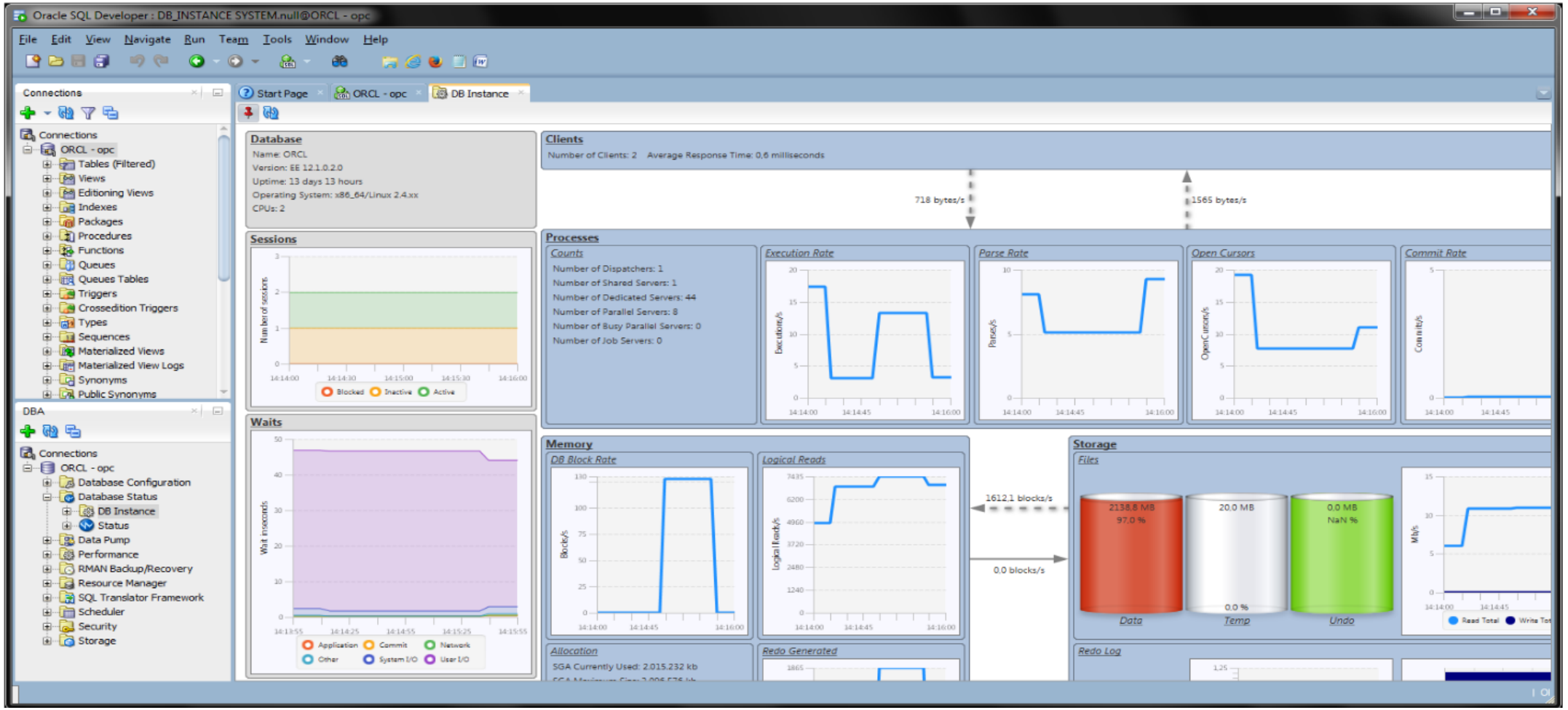
Oracle Database Cloud Service

SQL Developer 4.x – management of Oracle DB on-premise and in Cloud



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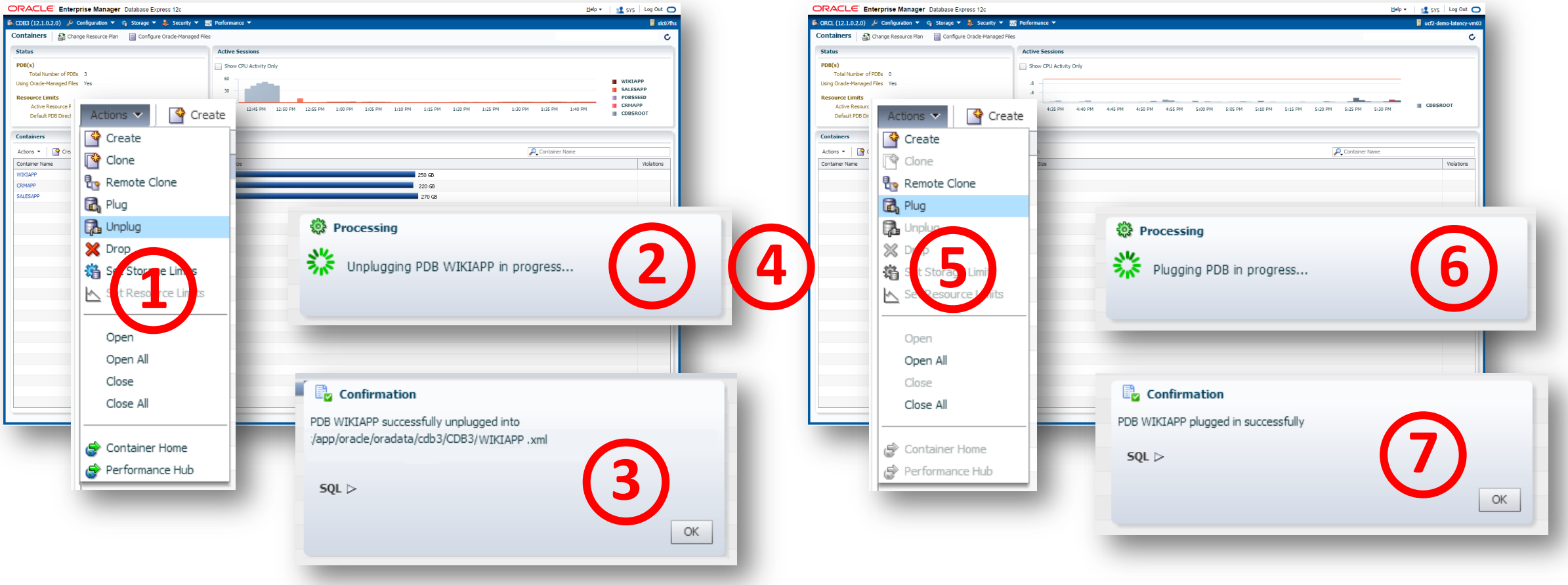
Oracle Database as a Service – EM Express 12c

Step by Step to Clone or Move your Pluggable Database to the Cloud

On-Premise Database

Oracle Cloud Database



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Oracle Database Cloud Service

DBaaS Initial Provisioning

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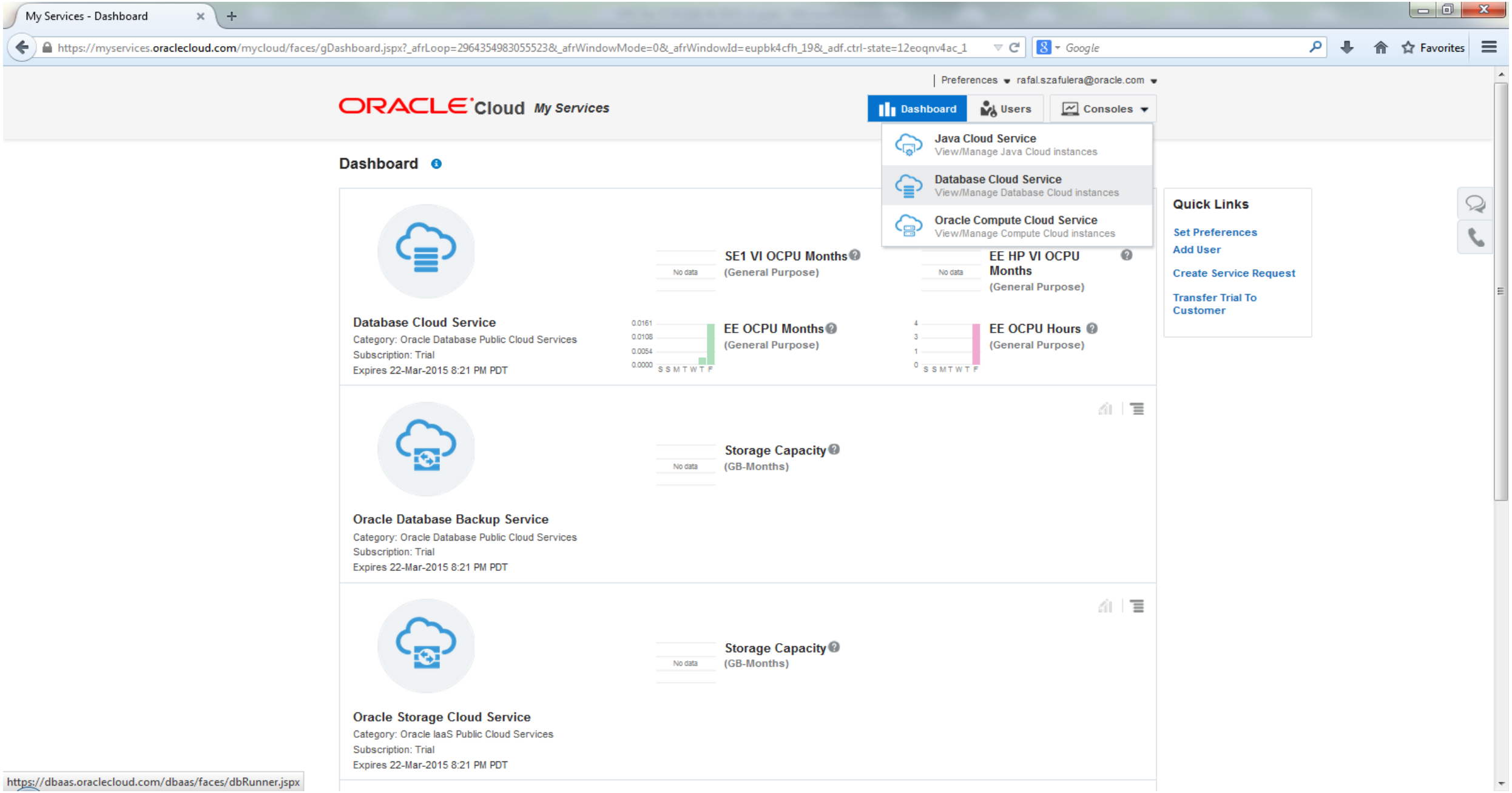
My Services - Dashboard
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Google
Favorites
Preferences
rafal.szafulera@oracle.com
ORACLE Cloud My Services
Dashboard
Users
Consoles
Java Cloud Service
View/Manage Java Cloud instances
Database Cloud Service
View/Manage Database Cloud instances
Oracle Compute Cloud Service
View/Manage Compute Cloud instances
Dashboard
Database Cloud Service
Category: Oracle Database Public Cloud Services
Subscription: Trial
Expires 22-Mar-2015 8:21 PM PDT
SE1 VI OCPU Months
(General Purpose)
No data
EE HP VI OCPU Months
(General Purpose)
No data
EE OCPU Months
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S S M T W T F
EE OCPU Hours
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4
3
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0
S S M T W T F
Quick Links
Set Preferences
Add User
Create Service Request
Transfer Trial To Customer
Oracle Database Backup Service
Category: Oracle Database Public Cloud Services
Subscription: Trial
Expires 22-Mar-2015 8:21 PM PDT
Storage Capacity
(GB-Months)
No data
Oracle Storage Cloud Service
Category: Oracle IaaS Public Cloud Services
Subscription: Trial
Expires 22-Mar-2015 8:21 PM PDT
Storage Capacity
(GB-Months)
No data
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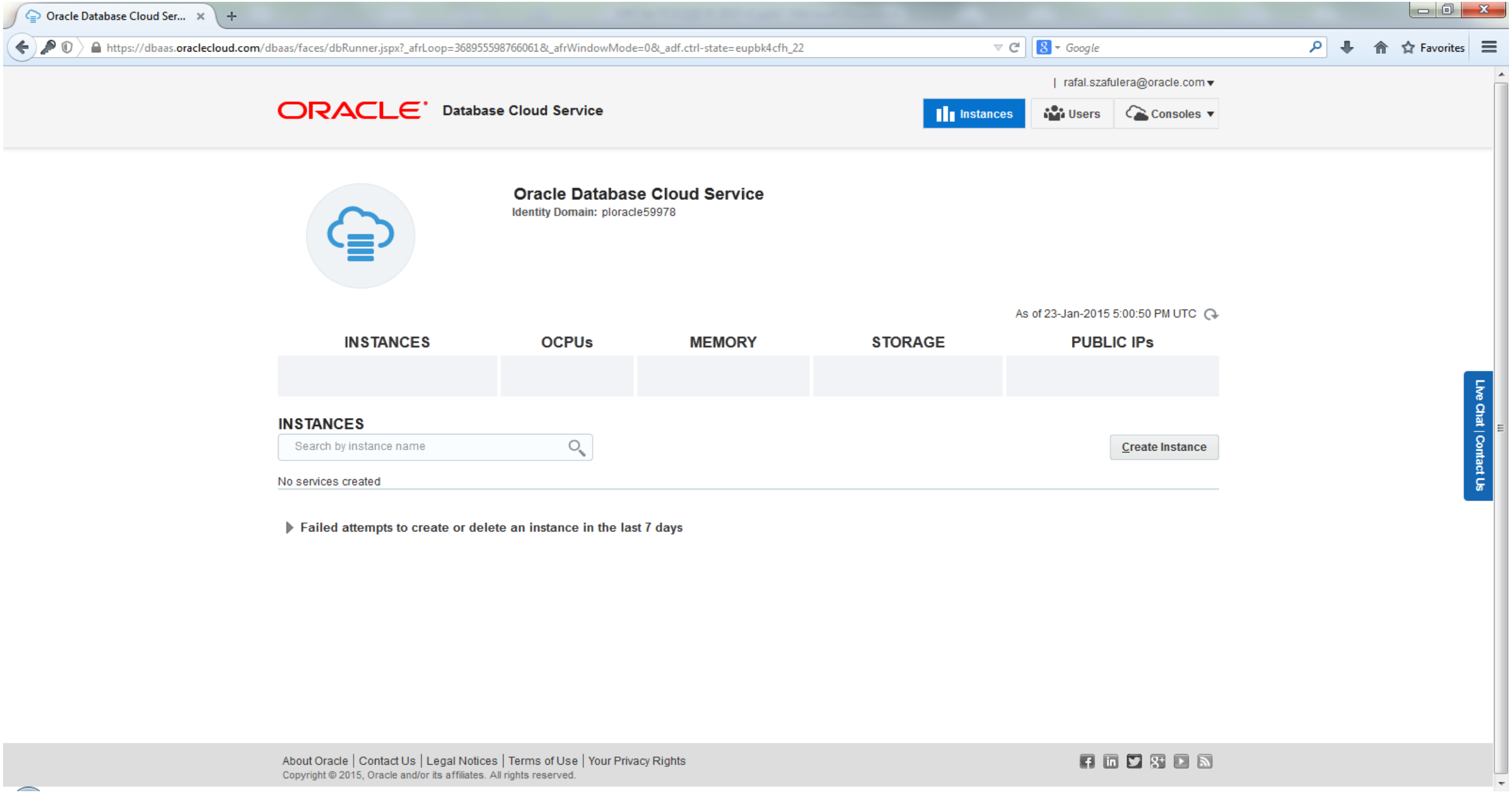
Oracle Database Cloud Ser...
https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22
Google
Favorites
rafal.szafulera@oracle.com
ORACLE Database Cloud Service
Instances
Users
Consoles
Oracle Database Cloud Service
Identity Domain: ploracle59978
As of 23-Jan-2015 5:00:50 PM UTC
INSTANCES
OCPUs
MEMORY
STORAGE
PUBLIC IPs
INSTANCES
Search by instance name
Create Instance
No services created
Failed attempts to create or delete an instance in the last 7 days
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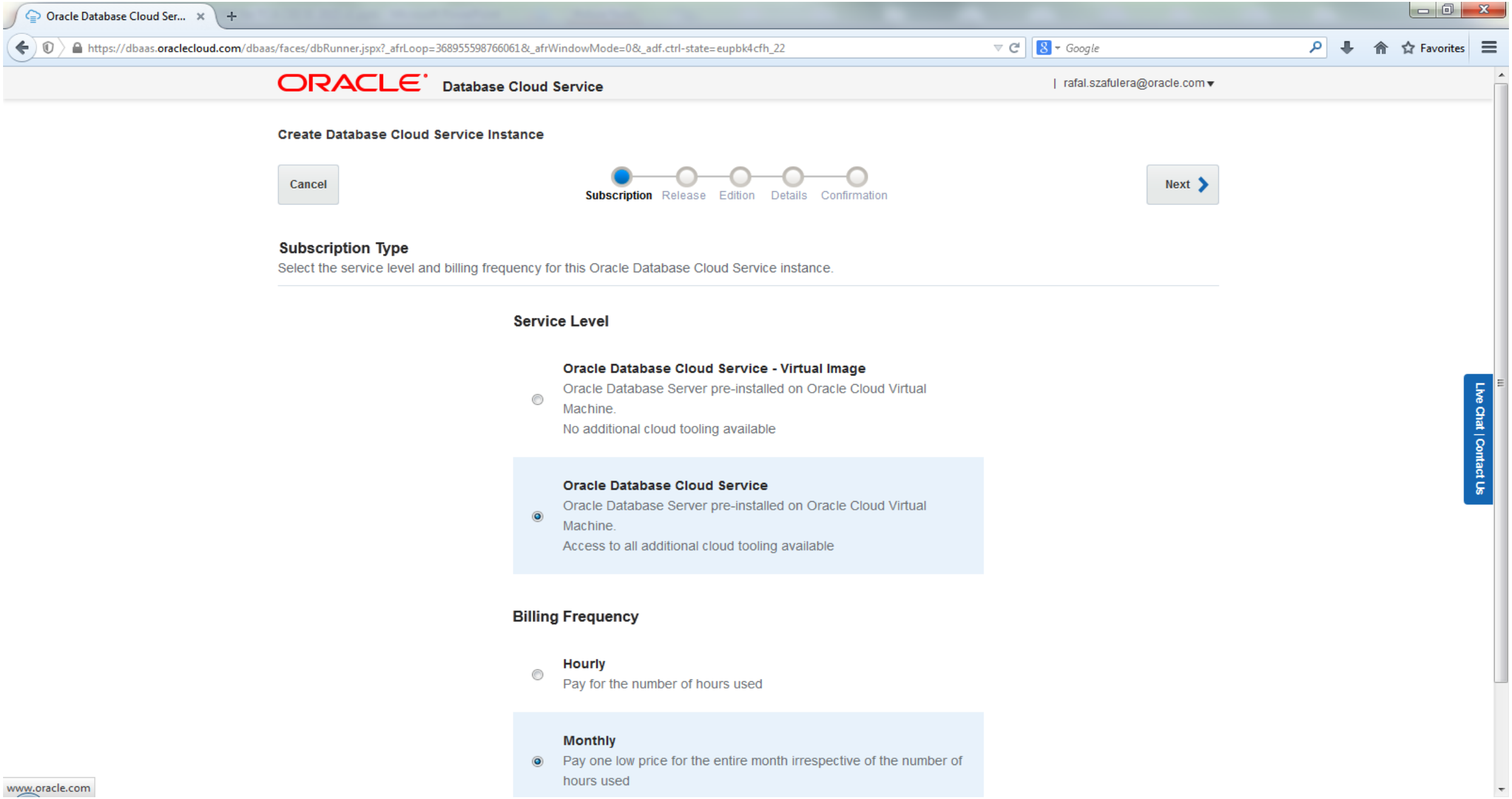
Oracle Database Cloud Ser...
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Google
Favorites
ORACLE Database Cloud Service
rafal.szafulera@oracle.com
Create Database Cloud Service Instance
Cancel
Subscription Release Edition Details Confirmation
Next
Subscription Type
Select the service level and billing frequency for this Oracle Database Cloud Service instance.
Service Level
Oracle Database Cloud Service - Virtual Image
Oracle Database Server pre-installed on Oracle Cloud Virtual Machine.
No additional cloud tooling available
Oracle Database Cloud Service
Oracle Database Server pre-installed on Oracle Cloud Virtual Machine.
Access to all additional cloud tooling 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
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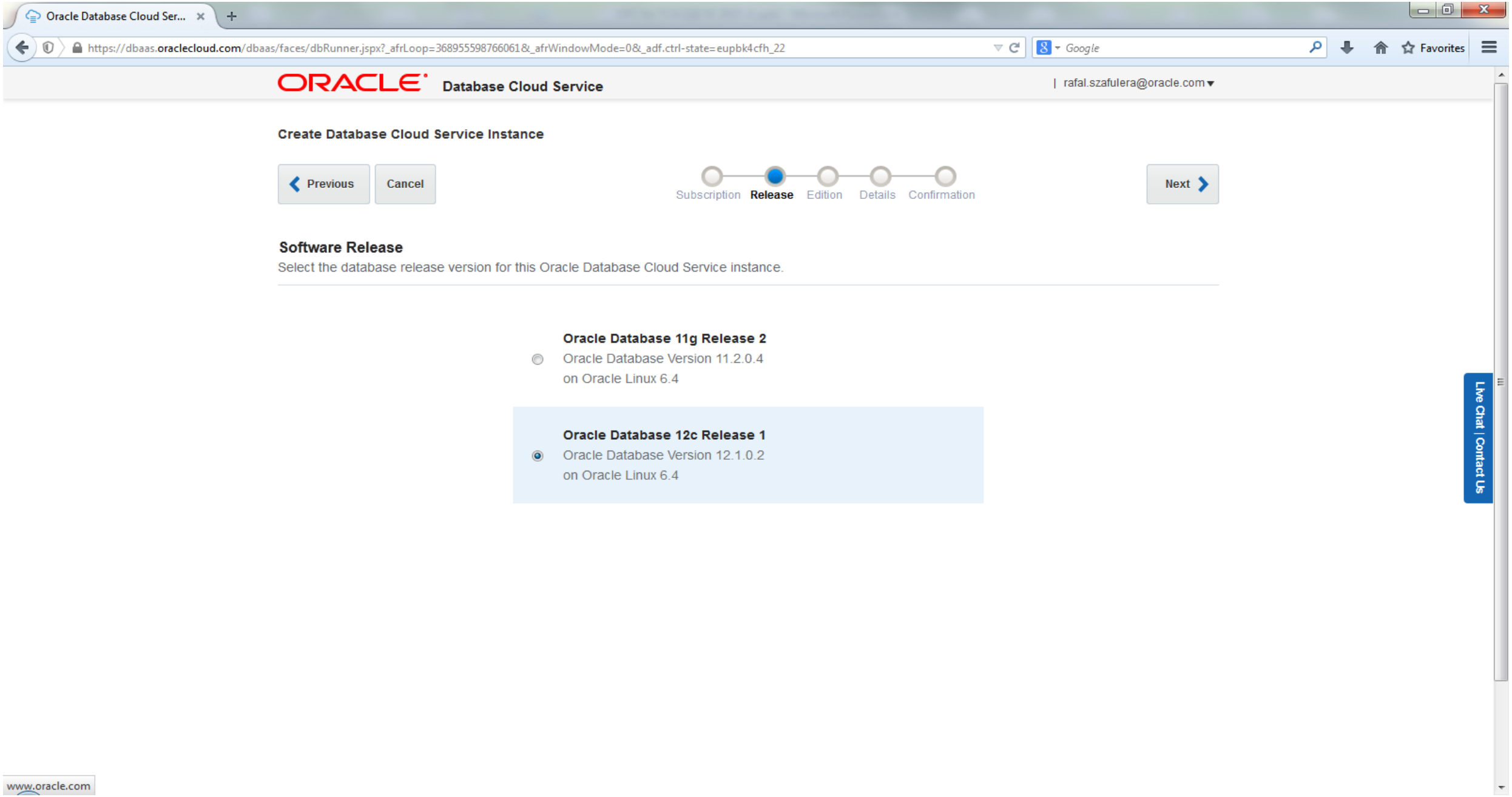
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Google
Favorites
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Database Cloud Service
rafal.szafulera@oracle.com
Create Database Cloud Service Instance
Previous
Cancel
Subscription
Release
Edition
Details
Confirmation
Next
Software Release
Select the database release version for this Oracle Database Cloud Service instance.
Oracle Database 11g Release 2
Oracle Database Version 11.2.0.4
on Oracle Linux 6.4
Oracle Database 12c Release 1
Oracle Database Version 12.1.0.2
on Oracle Linux 6.4
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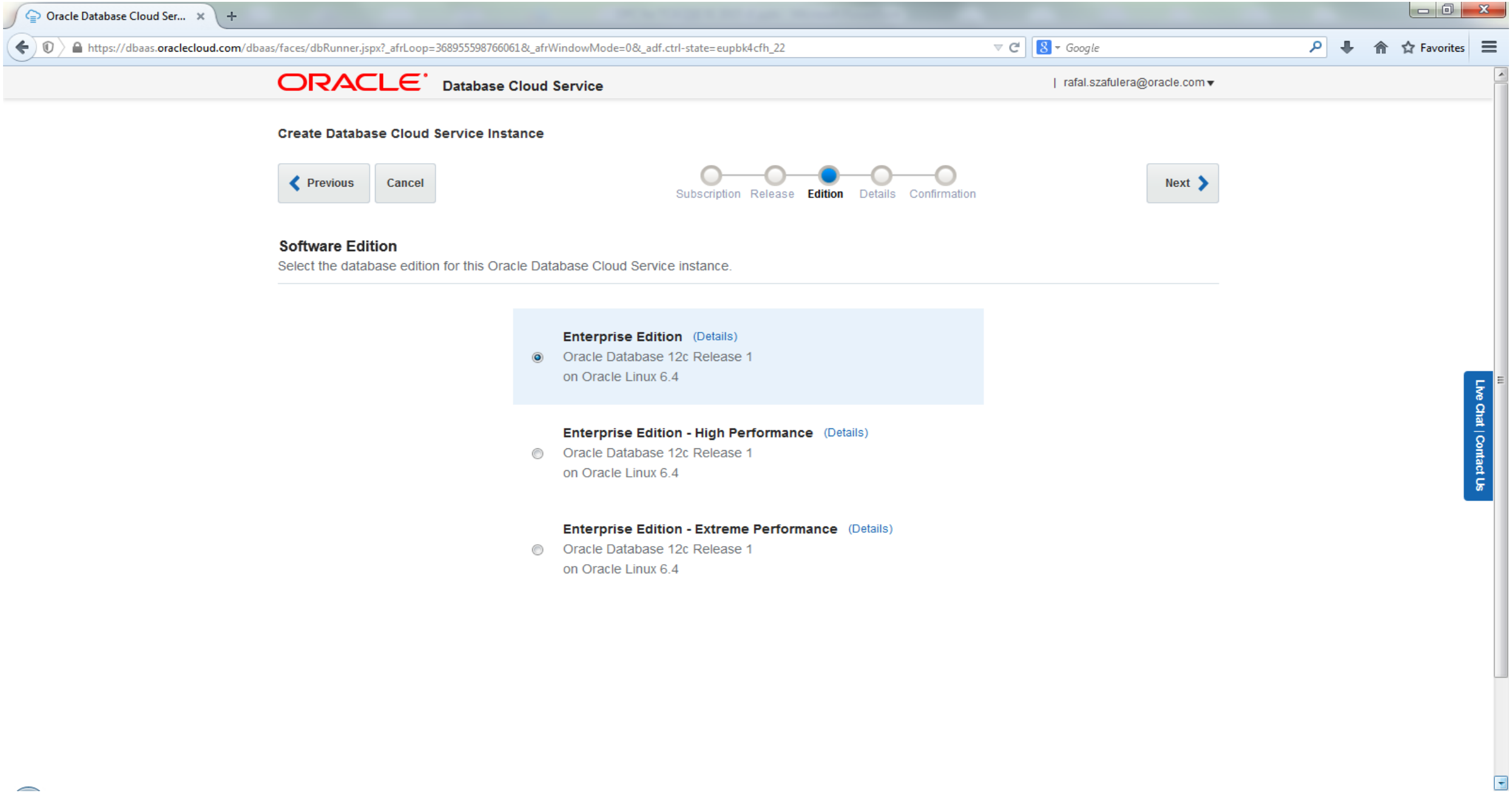
Oracle Database Cloud Ser...
https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22
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Create Database Cloud Service Instance
Previous
Cancel
Subscription
Release
Edition
Details
Confirmation
Next
Software Edition
Select the database edition for this Oracle Database Cloud Service instance.
Enterprise Edition (Details)
Oracle Database 12c Release 1
on Oracle Linux 6.4
Enterprise Edition - High Performance (Details)
Oracle Database 12c Release 1
on Oracle Linux 6.4
Enterprise Edition - Extreme Performance (Details)
Oracle Database 12c Release 1
on Oracle Linux 6.4
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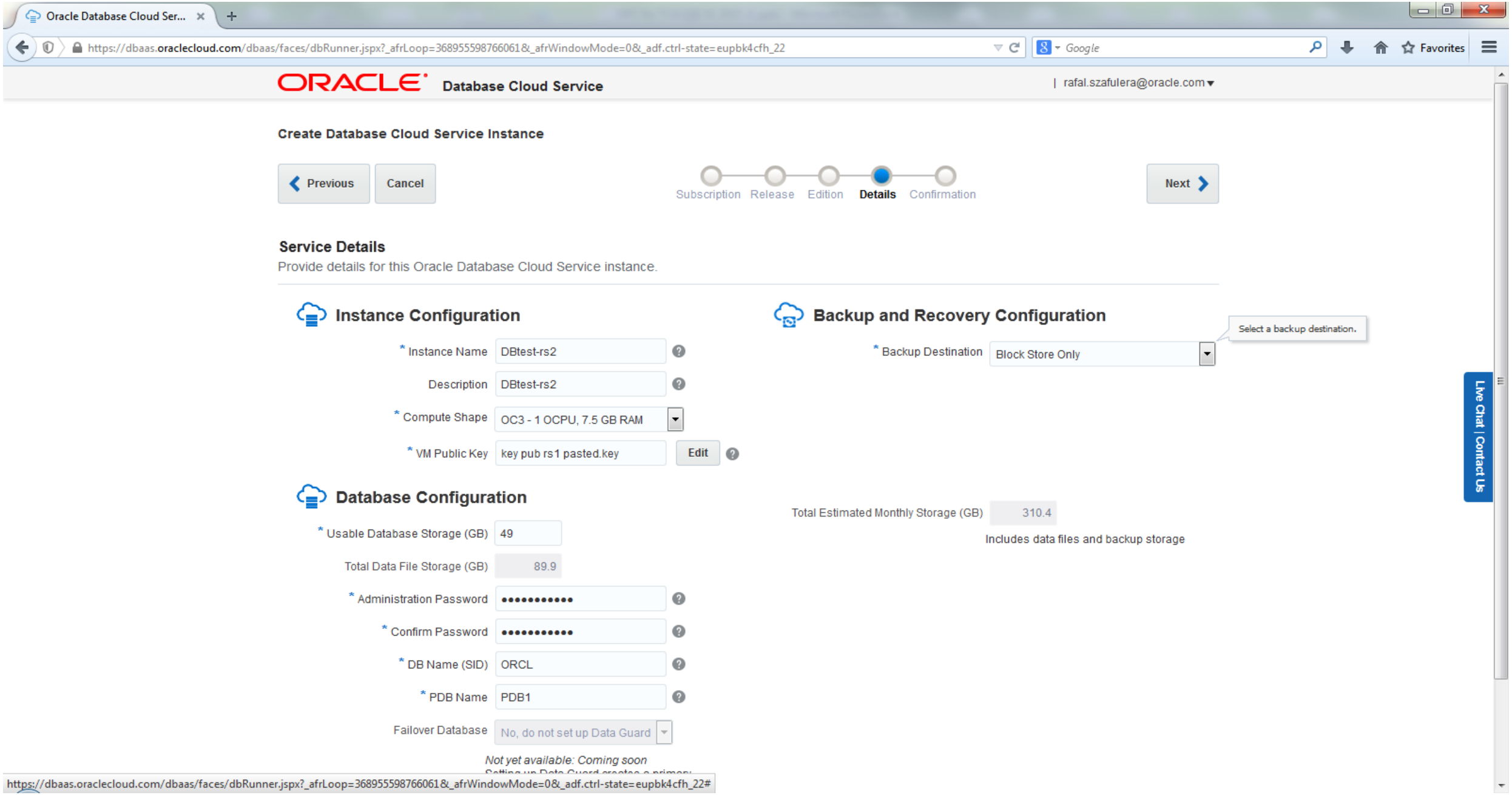
Oracle Database Cloud Ser...
https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22
Google
Favorites
ORACLE Database Cloud Service
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Create Database Cloud Service Instance
Previous
Cancel
Subscription
Release
Edition
Details
Confirmation
Next
Service Details
Provide details for this Oracle Database Cloud Service instance.
Instance Configuration
* Instance Name
DBtest-rs2
Description
DBtest-rs2
* Compute Shape
OC3 - 1 OCPU, 7.5 GB RAM
* VM Public Key
key pub rs1 pasted.key
Edit
Backup and Recovery Configuration
Select a backup destination.
* Backup Destination
Block Store Only
Database Configuration
* Usable Database Storage (GB)
49
Total Data File Storage (GB)
89.9
* Administration Password
* Confirm Password
* DB Name (SID)
ORCL
* PDB Name
PDB1
Failover Database
No, do not set up Data Guard
Not yet available: Coming soon
Total Estimated Monthly Storage (GB)
310.4
Includes data files and backup storage
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https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22#

Oracle Database Cloud Ser...

https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22

Google

Favorites

ORACLE Database Cloud Service

rafal.szafulera@oracle.com

Create Database Cloud Service Instance

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 12c Release 1
Software Edition: Enterprise Edition
Instance Name: DBtest-rs2
Description: DBtest-rs2
Compute Shape: OC3 - 1 OCPU, 7.5 GB RAM
Key: key pub rs1 pasted.key
Usable Database Storage: 49
Total Data File Storage: 89.9
DB Name (SID): ORCL
PDB Name: PDB1

Backup Destination: DISK

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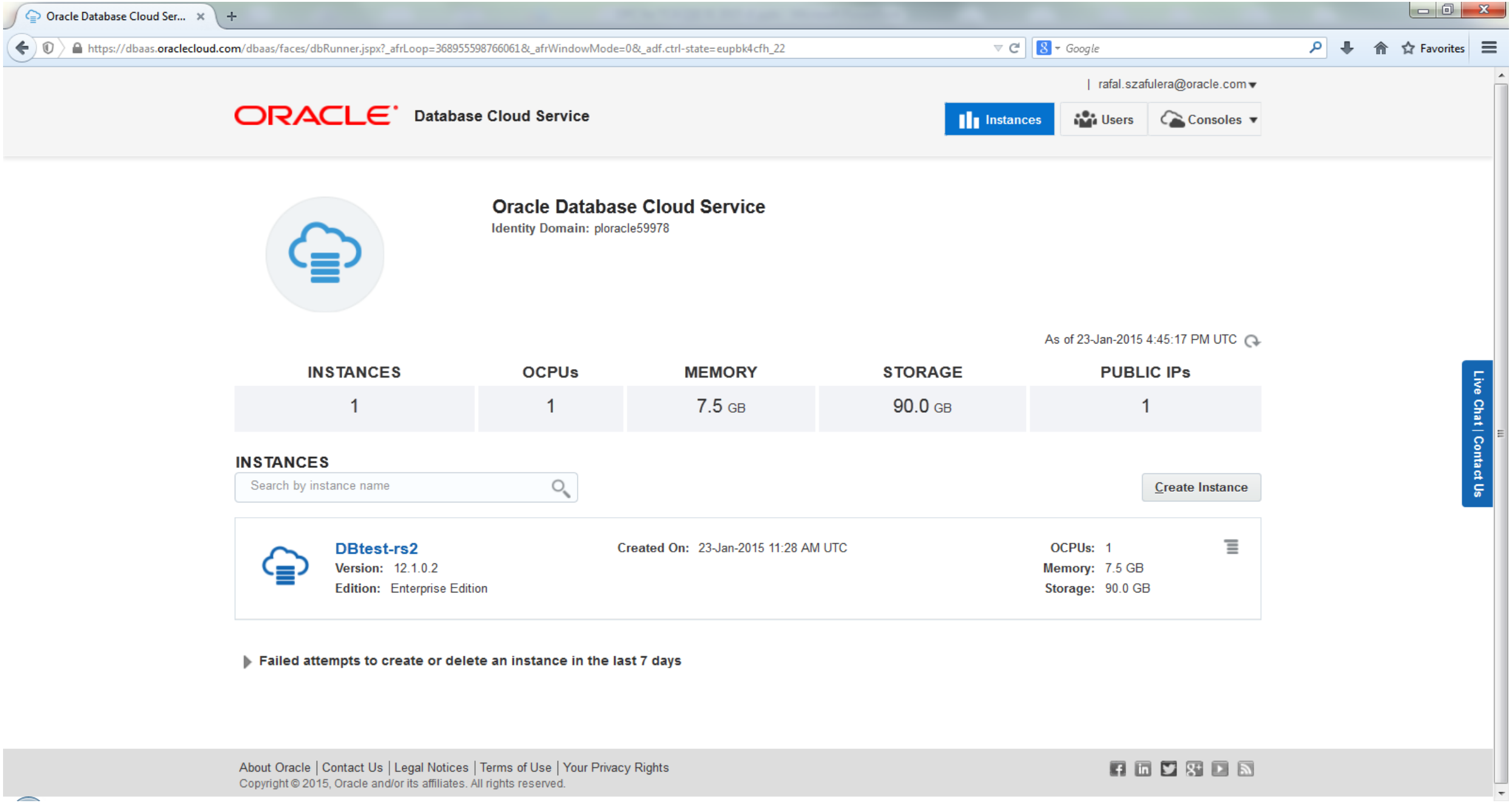
Oracle Database Cloud Ser...
https://dbaas.oraclecloud.com/dbaas/faces/dbRunner.jspx?_afrLoop=368955598766061&_afrWindowMode=0&_adf.ctrl-state=eupbk4cfh_22
Google
Favorites
rafal.szafulera@oracle.com
ORACLE Database Cloud Service
Instances
Users
Consoles
Oracle Database Cloud Service
Identity Domain: ploracle59978
As of 23-Jan-2015 4:45:17 PM UTC
INSTANCES
OCPUs
MEMORY
STORAGE
PUBLIC IPs
1
1
7.5 GB
90.0 GB
1
INSTANCES
Search by instance name
Create Instance
DBtest-rs2
Version: 12.1.0.2
Edition: Enterprise Edition
Created On: 23-Jan-2015 11:28 AM UTC
OCPUs: 1
Memory: 7.5 GB
Storage: 90.0 GB
Failed attempts to create or delete an instance in the last 7 days
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Oracle Database as a Service – Use Cases

- Lift and Shift (of Departmental and Line-of-Business apps)
- New Applications
- Development and Test
- Temporary project environments
- Training environments
- Java Applications, and Oracle ADF Apps
- Oracle Application Express (APEX) Apps
- RESTful Web Services for HTML5 and Mobile Apps
- Oracle SaaS custom extensions
- 12c adoption

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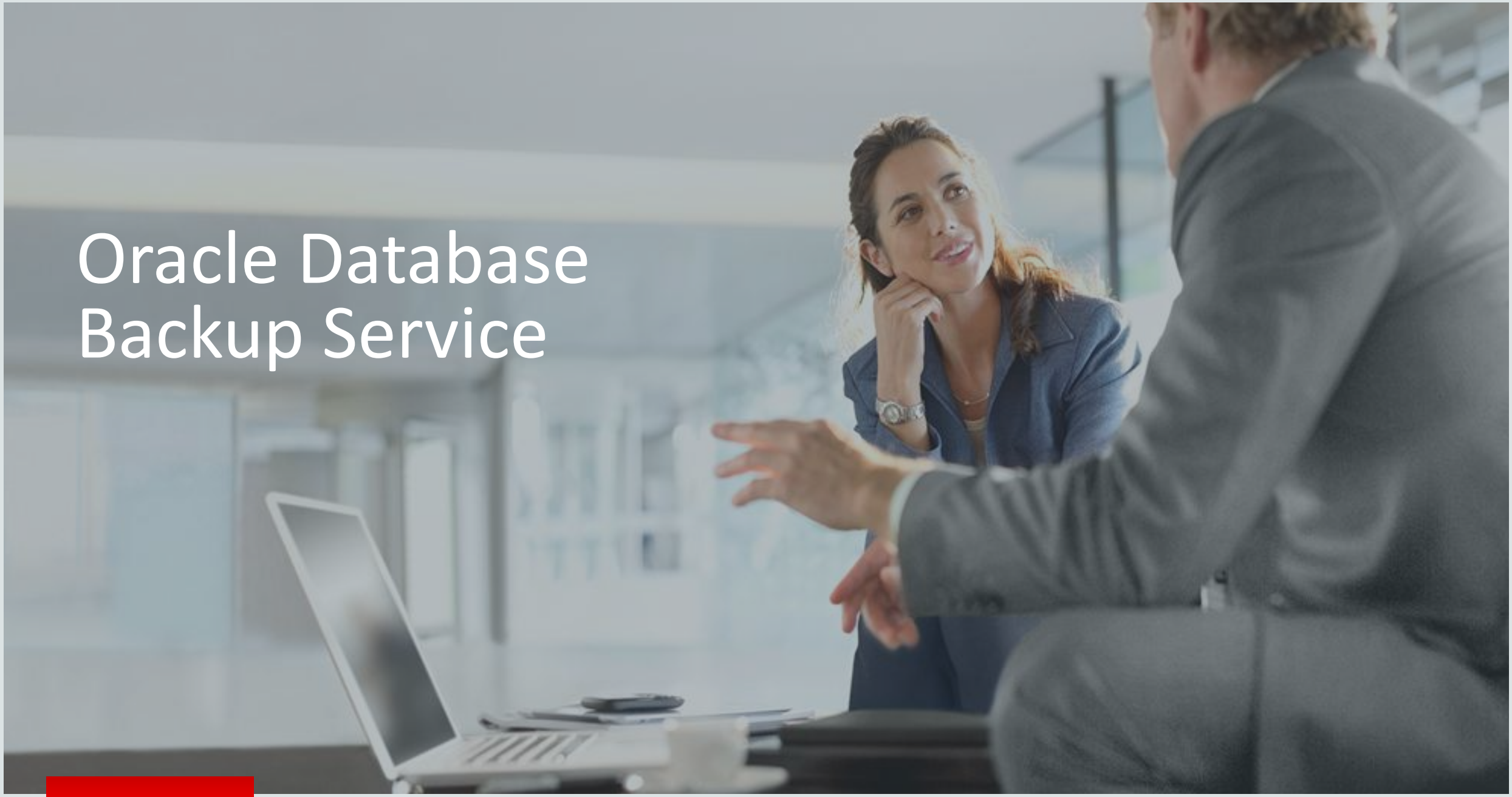
Oracle Database Backup Service



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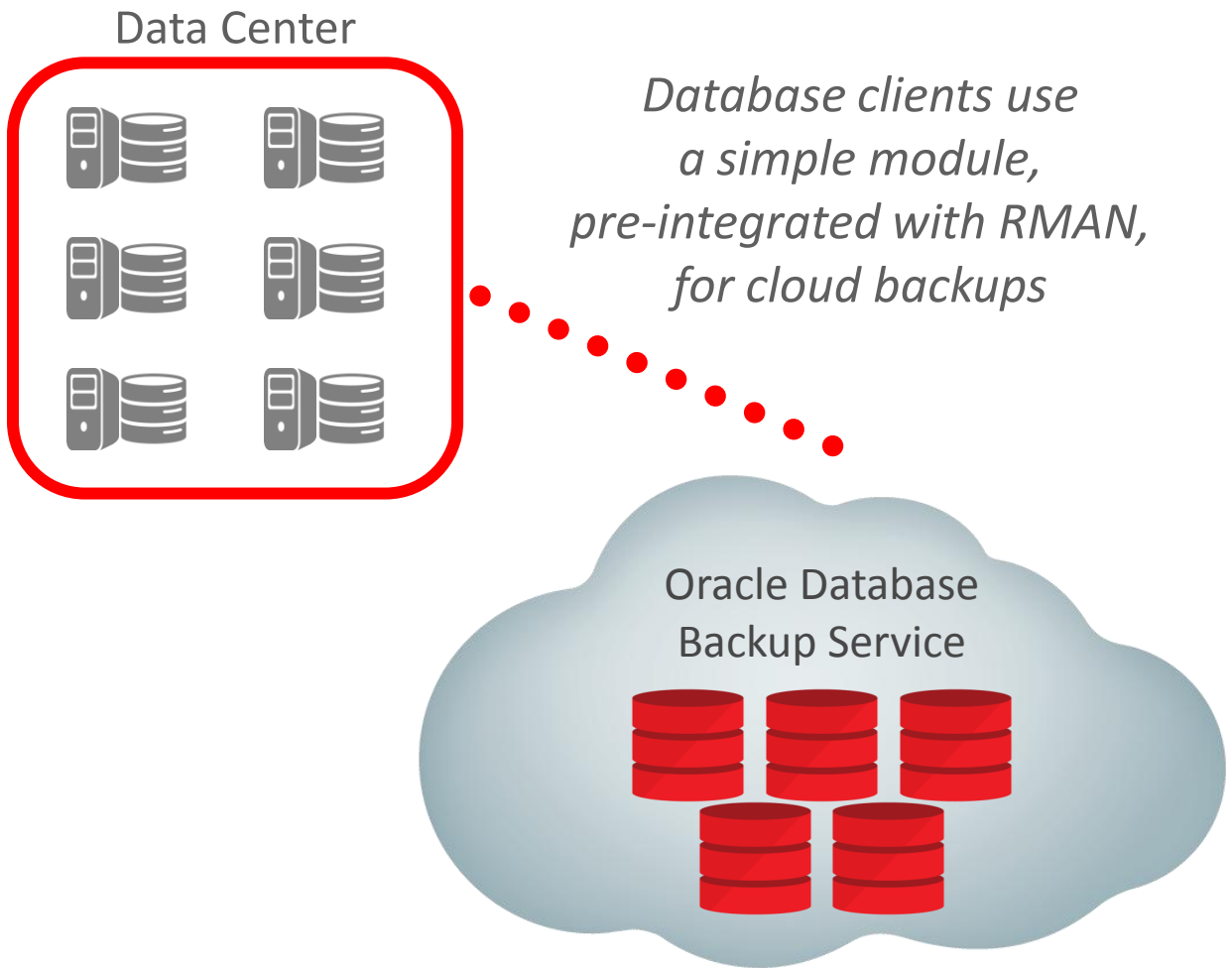
Oracle Database Backup Service

Replace Offsite Tape Backups with Simple and Low Cost Cloud Backup

- Backup on-premise or Cloud Databases to Oracle Database Backup Service hosted in Oracle Public Cloud
- Cost effective, scalable cloud storage for database backups: $33/TB per month
- End-to-end enterprise-grade data encryption, compression and protection
  - Clients: Data is always encrypted with keys kept locally at client, optionally compressed, and securely transmitted
  - Cloud: Encrypted data is protected with 3-way mirroring on every write



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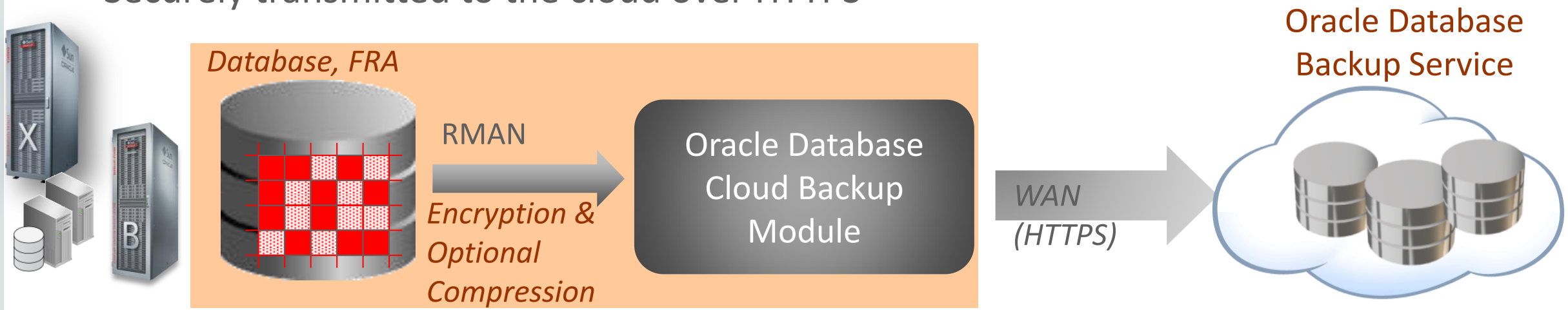
Oracle Database Cloud Backup Module

- Download and install the RMAN SBT module from OTN
- Backups streamed to Oracle Cloud using SBT (Tape) library
- Seamless integration with the Recovery Manager (RMAN)
- Use regular RMAN commands with no new commands to learn
- RMAN encryption for backups - keys kept locally to client
- Securely transmitted to the cloud over HTTPS



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Support Matrix

	Versions
Oracle Database - EE	10.2, 11g, 12c (64 bits)
Oracle Database - SE	10.2, 11g, 12c (64 bits) + Patch 18339044
Platforms (64 bits)	Linux, Solaris, SPARC, Windows, HP-UX, AIX, zLinux
RMAN Compression	HIGH, MEDIUM, BASIC, LOW *(depends on DB version)*
RMAN Encryption	Password, TDE, Dual-mode

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Oracle Database Cloud Service

Packaging and Pricing

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Oracle Database Cloud Service: Pricing

Database as a Service - General Purpose Compute

Product (per OCPU)	Virtual Image	Virtual Image + Cloud Tooling
Standard Edition 1	$400 / Month $0.672 / Hour	$600 / Month $1.008 / Hour
Enterprise Edition	$1,500 / Month $2.520 / Hour	$3,000 / Month $5.040 / Hour
Enterprise Edition - High Performance	$2,000 / Month $3.360 / Hour	$4,000 / Month $6.720 / Hour
Enterprise Edition - Extreme Performance	$3,000 / Month $5.040 / Hour	$5,000 / Month $8.401 / Hour

Database as a Service - High-Memory Compute

Product (per OCPU)	Virtual Image	Virtual Image + Cloud Tooling
Standard Edition 1	$500 / Month $0.840 / Hour	$700 / Month $1.176 / Hour
Enterprise Edition	$1,600 / Month $2.688 / Hour	$3,100 / Month $5.208 / Hour
Enterprise Edition - High Performance	$2,100 / Month $3.528 / Hour	$4,100 / Month $6.888 / Hour
Enterprise Edition - Extreme Performance	$3,100 / Month $5.208 / Hour	$5,100 / Month $8.569 / Hour

Database Schema Service

Product	Price	Storage [1]	Transfer [2]
Database S5	$175 / Month	5GB	30GB / Month
Database S20	$900 / Month	20GB	120GB / Month
Database S50	$2,000 / Month	50GB	300GB / Month

- General Purpose -> 7.5GB Memory per 1 OCPU*
- High Memory -> 15GB Memory per 1 OCPU*

Available on Pricing Tab @ https://cloud.oracle.com

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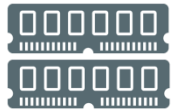
Oracle Database Cloud Service – Compute Shapes



OCPU	Standard Memory (GB)	High Memory (GB)
1	7.5	15
2	15	30
4	30	60
8	60	120
16	120	240

OCPU is defined as the CPU capacity equivalent of one physical core of an Intel Xeon processor with hyper threading enabled. Each OCPU corresponds to two hardware execution threads, known as vCPUs.
http://www.oracle.com/us/corporate/contracts/paas-iaas-public-cloud-2140609.pdf

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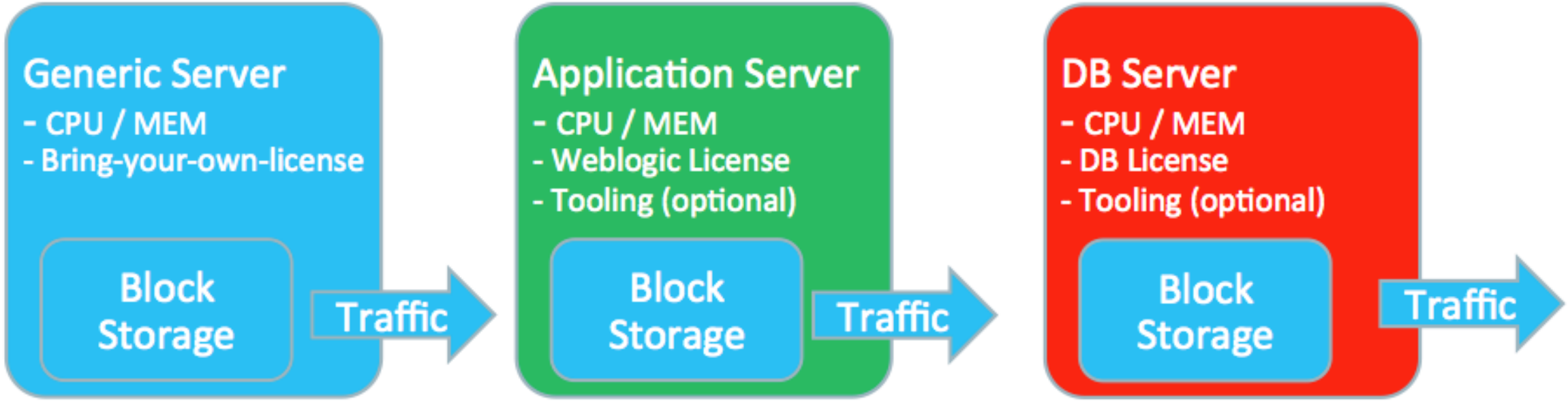
Pre-Paid Subscriptions: Different Types

Pre-paid subscription based solution



Oracle IaaS Public Cloud Services

Oracle Java Public Cloud Services

Oracle Database Public Cloud Services

Pre-paid subscription buckets

Outbound Data Traffic = actual usage in Gb
Static IP = per hour
Compute Cloud Block Storage = Capacity and IO per month
Object Storage (optional) = Capacity per month

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Oracle Database as a Service

Summary

- Same architecture, standards and products for on-premise & cloud
- Automation - Reduced Time and Cost of Provisioning and Management
- Standardization of Services Eases DB Fleet Management
- Elasticity - Capacity on Demand
- Easier Adoption of Full Oracle Capabilities through Automation
  - Real Application Clusters (RAC), Data Guard, Active Data Guard, TDE Encryption, Multitenant PDBs, Compression, Partitioning, Spatial, Text, JSON, XML, In-Memory, Performance and Tuning Advisors, ASM, REST
- Subscription Pricing of broadest choice of Oracle Software

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