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Oracle IaaS

Quick Reference Guide to Cloud
Solutions

—
Okcan Yasin Saygili

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Oracle IaaS

Quick Reference Guide to Cloud Solutions



Okcan Yasin Saygili



Apress®

Oracle IaaS: Quick Reference Guide to Cloud Solutions

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Printed on acid-free paper

*To all my family,
especially my mother, my father, my sister...*

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About the Author



Okcan Yasin Saygili is a cloud and database consultant at Oracle Partner HUB. His first aim is to engage Oracle partners in business development in the cloud. His second is for partners to achieve competitive database migration to the Oracle cloud/on-premise database and to deliver adoption services and business development for enterprise resource planning (ERP) to them. In other words, his objective is to increase use of the Oracle product family in the Oracle partner environment. To do so, he establishes one-to-one partner connections and performing migrations/upgrades. In addition, Yasin is responsible for project management, developing systems, database migration, adoption, and all pre-sales activities for seven countries in the partner environment. He also creates product workshops and web casts for partners and writes blogposts.

Yasin was selected for inclusion in EMEA's "Top 75 Promising Young Students" by IBM Brussels and received executive IT training at IBM Brussels, Belgium.

Yasin is an Oracle ACE. His main areas of expertise are database management and software engineering. He is also one of the management members of TROUG (Turkish Oracle User Group).

Yasin is a startup project guru and has developed nearly 10 software projects, including the well-known CompileLab.

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Murthy Garimella is a software professional with 20 years of experience in partner relationships, customer relationship management, public/private cloud solutions, managing consulting services, software product development, software analysis, and design, development, and deployment of applications and systems.



Robert Pastijn has worked with Oracle products since 1995, initially exclusively the Oracle database. In his current role as part of database product management on Oracle's product development team, Robert works with customers and partners, promoting the latest and greatest that Oracle has to offer, including, but not limited to, database, Exadata, Linux, and virtualization. Also part of his portfolio are the IaaS and DBaaS offerings from Oracle, which he uses on a daily basis as the administrator of the more than 40 IaaS and Ravello environments his PTS (Phoronix Test Suite) team uses worldwide for training and proof of concept.

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Foreword

Cloud transformation has created a huge disruption: How can customers leverage public cloud services and deployment models to dramatically reduce costs, improve profitability, and invest in innovation? The fundamental dilemma faced by leaders and, by extension, providers of commercial software applications is how to effectively reduce costs and increase profitability while at the same time continuing to invest in innovation.

This is where I see tremendous opportunity for companies and partners to leverage Oracle cloud services, helping them to effectively balance these priorities and critical business objectives while at the same time ensuring that cost reduction and profitability do not come entirely at the expense of innovation.

By migrating applications, our customers can not only reduce upfront costs and capital expenditures but also drive sustainable long-term improvements in profitability based on the tooling, automation, and life cycle management capabilities inherent in Oracle cloud platform services. Oracle's IaaS has the best performance/price on the market, allowing users to lift and shift any technologies and then innovate and scale.

Vendors and customers can enrich their existing applications with new, value-added functionality and, in so doing, accelerate innovation and increase value to their customers. They can also reduce their ongoing development costs (and accelerate time to market) by leveraging Oracle's R&D spending in the cloud (IoT, big data, analytic, and so much more).

By scaling their applications on Oracle's enterprise-grade cloud platform, Oracle's users can drive further cost reduction and economies of scale. They can also improve application performance and reliability.

Finally, the large ISV ecosystem can take advantage of the Oracle cloud marketplace to dramatically expand users' addressable opportunities and reach new segments of prospective customers. Our customers can now deploy a growing portfolio of cloud-ready applications matching their technical and business needs.

What are the basics? How to start? What shall you consider? This book will bring you the knowledge to leverage the full value of the Oracle cloud platform.

—Kamil Güçlü
VP, EMEA ISV & OEM Sales Leader

■ FOREWORD

We're in a new era of computing. Our way of doing business is changing. Data is becoming the most important asset for companies. To be a data-driven company, a simpler, more agile, self-service, and less costly infrastructure is required. Cloud is the core enabler of this transformation. IT has had several transformations in the past decades, and Oracle has always been a main player in those transformations, such as client/server, Internet, engineered systems, and now cloud. Yasin has done a great job of introducing Oracle IaaS cloud services to all who are willing to be part of this great transformation.

—Sedat Zencirci
Sales Consulting Senior Director, CAT and Turkey

CHAPTER 1



Oracle Cloud

Cloud is a technology solution that is growing and expanding with every passing day. Today, you can keep your social media data, such as Instagram and Flickr, in addition to all your enterprise data in the cloud. Thus, everybody is looking for ways to store data for less money and greater facility. Under the impact of current changes, the IT industry seeks to move on-premise solutions to the cloud. The biggest advantage of cloud is the cost savings realized from its use on a “pay as you go” basis. Thereby, projects can be initiated at low cost. On the other hand, on-premise solutions must be purchased. However, much of the time, these solutions aren’t estimated correctly or used completely. A project may be started without expensive hardware and software and then change to meet new requirements. The result of such unpredictability is that money may have been wasted.

Cloud solutions provide an opportunity to work with your team members, so that everyone can, for example, easily connect to a cloud account for editing, copying, and deleting team documents on the cloud service.

Cloud affects many sectors in developing new solutions, particularly software solutions, a.k.a. Software as a Service (SaaS), in cloud terminology. Thus, a company doesn’t have to take on new infrastructure to maximize software applications.

Cloud has adapted to offer new solutions. First, Infrastructure as a Service (IaaS) is based on server-side architecture, so a customer can put applications to work on a big infrastructure service. In addition, new services may be required by customers, so platform service is generated, and the customer can use any application in the cloud whenever needed. Finally, if customers want to work applications in the cloud, they don’t have to change anything on the application side.

Cloud solutions can be applied in such sectors as health, retail, and software, among other major sectors. This basically means that cloud is a trend reaching countless people, and, therefore, as sectors grow, the market for cloud is growing with these sectors.

Advantages of Cloud

Cloud technology offers the ability to manage all solutions on remote servers. For those thinking about adopting cloud technologies, there are many advantages to consider, including the following:

- *Cost:* Cloud vendors offer services at a reasonable price, and customers can easily pay through cloud web sites. Oracle Cloud, for example, is bought through `shop.oracle.com`.
- *Flexibility:* Cloud technologies enable users to employ it from everywhere, and this is the most popular reason for using cloud services.
- *Disaster prevention:* Cloud services enable high-availability support for solutions to customers' problems.
- *Maintenance:* Cloud provides a specific service-level agreement (SLA) to customers, particularly hardware replacements.

Oracle Cloud Models

Oracle offers three types of cloud services: public, private, and hybrid.

- *Public cloud:* This service allows database administrators and developers to use the public cloud everywhere. Public cloud use can be initiated with a cloud account.
- *Private cloud:* Private cloud allows database administrators and developers use of the cloud for specific areas (i.e., a user's own data center), and only authorized users can connect with this cloud service.
- *Hybrid cloud:* Hybrid cloud refers to all cloud solutions working in one place.

Cloud Services

There are three main types of cloud services: Software as a Service, Platform as a Service, and Infrastructure as a Service.

SaaS (Software as a Service)

SaaS is a subscription model for the use of application services. Many Oracle Cloud applications support this model, so you can register a great number of business operations, such as sales, marketing, and human resources, with a subscription model.

PaaS (Platform as a Service)

PaaS is a subscription model for using infrastructure services. Modern infrastructure capabilities support cloud architecture. This service provides easy deployment and cost-effective maintenance, e.g., database cloud service, Java cloud service (PaaS: Database Management, Security, integration).

IaaS (Infrastructure as a Service)

IaaS is a subscription model for using hardware- (infrastructure-) related services. IaaS allows hardware engineers to use a hardware subscription for development and maintenance with a few clicks, e.g., Oracle's Storage Cloud Service, Compute Cloud Service, and Network Cloud Service (Container Cloud Service).

Oracle IaaS Cloud

Oracle Public Cloud was announced, and this product is a leading candidate for changing the database cloud market owing to the fact that Oracle Public Cloud must be learned in order to apply it to future database management. Since it was inaugurated, this Oracle Cloud service is growing day by day. Cloud is a trend, and it is becoming increasingly important to master its related technology as soon as possible. All database vendors have started to migrate technologies from on-premise to cloud.

Cloud is developed with engineered systems and hardware (Oracle hardware) and software, together with Oracle Cloud solutions. This book demonstrates how to effectively utilize your cloud service in the following order:

1. Compute Cloud Service
2. Storage Cloud Service
3. Network Cloud Service
4. Ravello Cloud Service
5. Container Cloud Service

Cloud Headlines

Cloud has introduced many new technical terms, and these must be understood, especially to undertake cloud service operations.

- *Identity domain*: The unique name for a customer. All operations are conducted under this name. Whenever you register a new service, it is created using this unique name. An identity domain is used to validate login credentials. In addition, Oracle support provides help by identifying you through this name. (Further assistance is provided by the Oracle Cloud help desk.)

- *Single sign-on (SSO)*: This feature provides secure login for users and access to multiple applications.
- *Data center (DC)*: Oracle provides data center locations for cloud users and assigns many locations from which to host numerous customer data applications.
- *Service*: The term refers to the name of a select service delivered by Oracle.
- *Oracle identity console*: This is the console that helps to manage users and roles.
- *Account*: This is used to show all account-related information.
- *Users*: This refers to a principal user and to the current user working with the services. (The name of the registered user is specified.)
- *Service administration*: This role can be assumed when creating and managing instance.
- *Account administration*: This role is assumed for monitoring and managing instance.
- *Identity domain administration*: This role is assumed during administrative activities.

Requesting a Trial Subscription

Cloud is divided into two basic subscription models. One model is a paid membership, and another is a trial membership. The latter is a 30-day limited model. Oracle now offers a free \$300 service for a pay-as-you-go model.

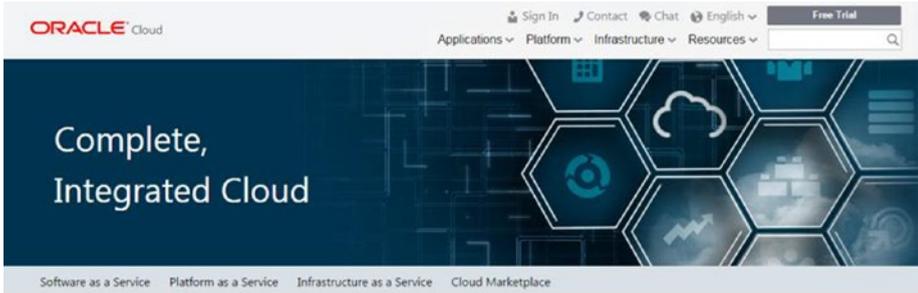
Getting Started: Oracle Cloud with a Trial Account

Oracle offers customers a renewable service. A trial account can be requested either for \$300 worth of free credits or 30 days, (whichever expires first) for any Oracle cloud service that offers a trial model. These services start upon activation, so the starting point is your subscription date.

In order to start an Oracle cloud trial, you must first have a `shop.oracle.com` account. This is the same as an Oracle PartnerNetwork (OPN) or Oracle Technology Network (OTN) account, so, basically, it is an Oracle SSO account. Through this account, you can request an Oracle cloud account for using the IaaS service. With a few clicks, an account can be registered for cloud service use. As of March 1, 2017, all pay-as-you-go services are included in a trial account.

The registration process includes the following steps:

1. Register database cloud service with your mail address through the web site <http://cloud.oracle.com> (see Figure 1-1).



Oracle Cloud is the industry's broadest and most integrated public cloud. It offers best-in-class services across software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS), and even lets you put Oracle Cloud in your own data center. Oracle Cloud helps organizations drive innovation and business transformation by increasing business agility, lowering costs, and reducing IT complexity.

Figure 1-1. Oracle registration

2. Find Oracle cloud Compute Service from the IaaS menu (Figure 1-2).



Figure 1-2. IaaS menu

3. Click the Free trial button to begin building your cloud service (Figure 1-3).
 - a. If you already have an Oracle account, click only Sign In on the login page.
 - b. If you do not have an Oracle account, click Get started for free and fill in the required information.

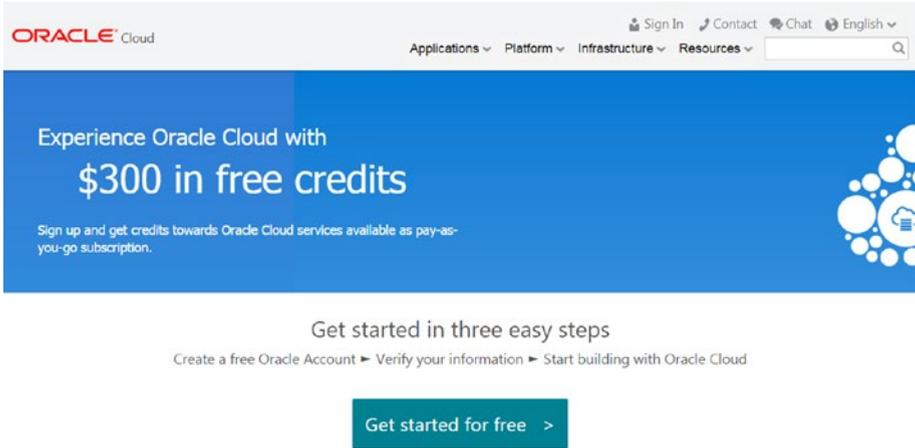


Figure 1-3. Free trial button

4. On the next page, sign in with your username and password on the login page.
5. For the following page, enter personal information, business information, and address information (Figure 1-4).

Hello!

Verify your contact details and confirm your mobile number by requesting and providing the verification code. Among other platform and infrastructure services, you will get free access for one month to:

Oracle Database
Database Backup

Java
Storage

Compute
Application Container

Developer
SOA

Contact Details

* First Name * Company

* Last Name

Verification Code

* Country Calling Code * Mobile Number

 * Verification Code

This verification code will be sent in a text message to your mobile phone. Standard text messaging rates apply. Oracle may also contact you at this phone number if we have questions about your trial.

Trial Details

* Name

If you decide to create a new account, pay attention to what you name your account as this value is displayed throughout the UI, may be visible in service URLs and even required when users log on to your service. We recommend that the account name indicates your organization and/or division name. Below is the preview of the My Services URL with the account name.

My Services URL Preview: [https://myservices.oraclecloud.com/mycloud/trconsulta/...](https://myservices.oraclecloud.com/mycloud/trconsulta/)

I understand and accept Oracle's Terms and Conditions

Figure 1-4. Entering contact information

6. The next page requests a verification code for your phone.
7. On the next page, enter your account name and click I understand and accept Oracle's Terms and Conditions.
8. On the following page, check the information from Review Summary. Now your cloud trial service is ready for login and other operations.
9. Refer to your e-mail and click the My Service Administration link sent by Oracle cloud service that you created shortly before (Figure 1-5).

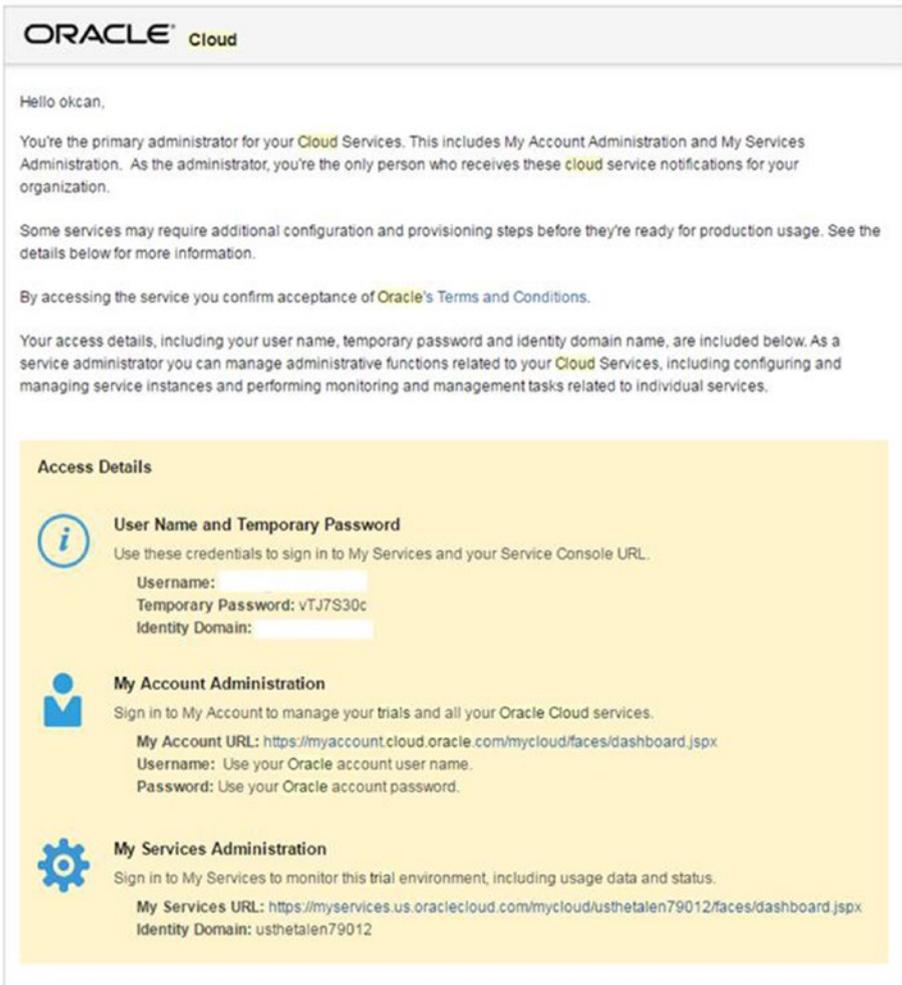


Figure 1-5. Confirmation e-mail

10. Next, to log in to the cloud service, enter your identity information (Figure 1-6).



Figure 1-6. *Entering identity information*

11. Enter your username (registered e-mail address) and temporary password from the registration e-mail (Figure 1-7).

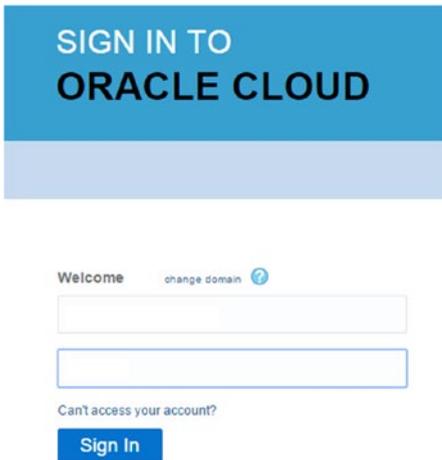


Figure 1-7. *Sign in*

12. Enter the new password and security questions protecting your password (Figure 1-8).

*Old Password *****
*Old Password ***** ⓘ
*Re-Type New Password *****

*Question1 What is your mother's maiden name? ▾ *Answer1 yok
*Question2 What is the name of your pet? ▾ *Answer2 yok
*Question3 What is the city of your birth? ▾ *Answer3 yok

Figure 1-8. Entering new password

13. Let's try to enter an e-mail address and password for logging in to the cloud account (Figure 1-9).

SIGN IN TO ORACLE CLOUD

Welcome change domain ⓘ

Can't access your account?

Sign In

Figure 1-9. Sign in with new password

Extend Trial

In some cases, extra time is needed for testing cloud applications further, so Oracle provides an additional 30 days of trial use. The operation by which to obtain this is as follows:

1. Go to the My Account Administration link from your e-mail (Figure 1-10).

My Account Administration
Sign in to My Account to manage your trials and all your Oracle Cloud services.
My Account URL: <https://myaccount.cloud.oracle.com/mycloud/faces/ide/dashboard.jspx>
Username: Use your Oracle account user name.
Password: Use your Oracle account password.

Figure 1-10. Account administration

2. Log in with your credentials.
3. Find the service you want to extend (Figure 1-11).

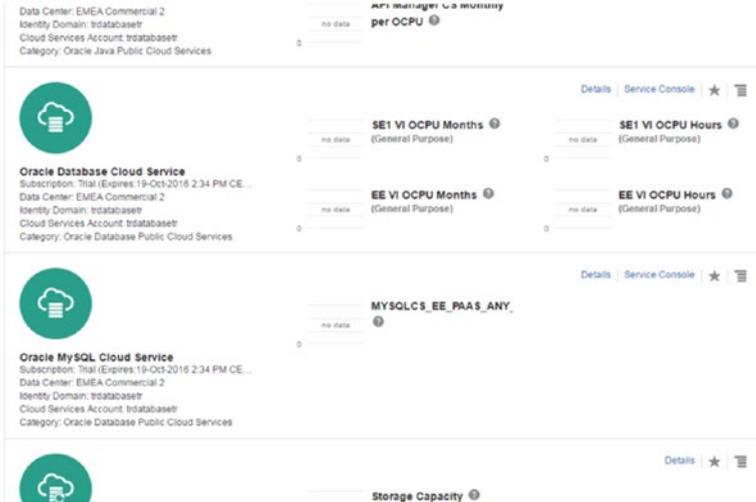


Figure 1-11. Select service to extend

4. Click Extend Trial (Figure 1-12).



Figure 1-12. Extending trial

5. Information will be sent to the DC by Oracle Cloud (Figure 1-13).

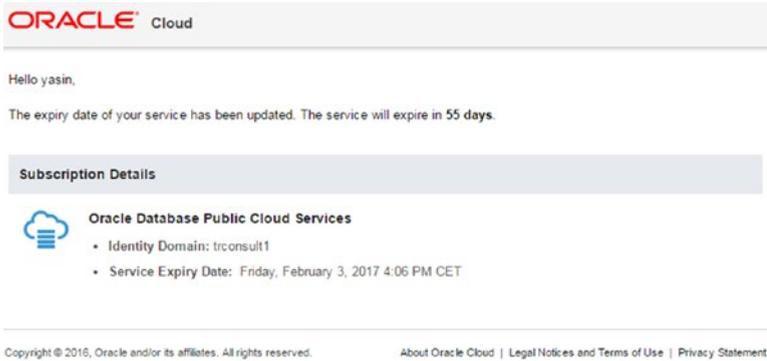


Figure 1-13. Subscription details

Summary

In this chapter, you have seen how to create (get access) to a new Oracle Cloud service through `cloud.oracle.com`. You have learned what these Oracle Cloud services are and have taken a look at the general cloud service categories. Cloud technology reflects the interest of all software vendors, and Oracle is one of the most important companies developing this business. In the next chapter, I will discuss Oracle Cloud service and its architecture.

CHAPTER 2



Compute Cloud

Today, Compute Cloud is one of the top-notch services on the market. Many cloud providers support the compute service, which makes compute services the basis of many other cloud services, such as Platform as a Service (PaaS) and Software as a Service (SaaS) (see Figure 2-1). Compute is a new-generation service for creating new virtual machines that include many platforms. Compute services are integrated by many vendors, such as Oracle, Amazon, Azure, and other local vendors. Moreover, IaaS and PaaS have been developed to easily integrate and build new applications with only a few clicks. Compute services are built through new-generation virtualization technologies that are used in cloud infrastructure; therefore, one service can accommodate many customers from a single point.

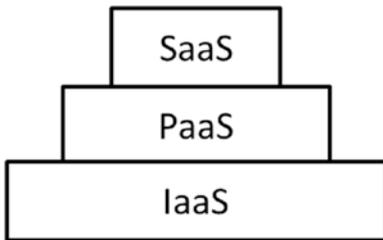


Figure 2-1. IaaS cloud pyramid

The biggest advantage of compute cloud services is consolidated management of many compute instances. Furthermore, it requires no extra IT staff or effort, such as database administrators (DBAs) or hardware support staff, thus companies can limit extra cost through compute instances. Old infrastructure providers can't create new instance dedicatedly, but new-generation vendors do, and this service allows changes in utilization. For example, if one CPU is settled in a compute service by customers but suddenly those customers change their minds about the CPU, the customers can change this CPU shape with new-generation compute services. Computing resources are isolated from one another for each node. All compute nodes are dedicated to your particular usage, and Oracle provides network isolation through a virtual private network (VPN).

At this point, Oracle is bringing its own experience for building new-generation compute services. Many advantages are accruing with new-generation cloud services, which are easily provisioned to migrate applications and to work virtual machines with scalable performance, securely and with scalability. Oracle services are able to work on many platforms: Linux distributions (Oracle Enterprise Linux, Debian), Solaris, and Microsoft Windows.

Advantages of IaaS

Oracle IaaS offers user experiences through innovative and useful design. In addition, IaaS has fabulous features that are helping to solve many problems for adopting and migrating current solutions. The features include:

1. **Provisioning.** The service offers rapid provisioning for creating virtual machines.
2. **Migration.** Owing to the ability to select the data center closest to a customer's location, data can be migrated easily from on-premise to cloud.
3. **Visibility.** A control panel is provided to easily monitor and control your service.
4. **Deployment.** The service provides multiple deployment options (such as GUI, REST, and API).
5. **Enterprise grade.** The service offers secure, high-performance, and high availability options for deploying applications.

Creating an Oracle Compute Service

To find and upload your operating system (Oracle offers many pre-built images based on Oracle Linux and customers' own uploaded images), you can use Oracle Cloud Market Place to select the operating system that you require, such as Microsoft Windows, Linux Debian, or Oracle Enterprise Linux.

Oracle Market Place can be found at <https://cloud.oracle.com/marketplace/faces/homePage.jspx>.

A new IaaS service can be obtained easily by taking the following steps:

1. First, click Compute Cloud Service from the dashboard, and the service page will show account information (Figure 2-2).



Figure 2-2. Clicking Oracle Compute Cloud Service

2. Check your metrics under “Billing Metrics.” (This metric shows OCPU usages). (See Figure 2-3.)

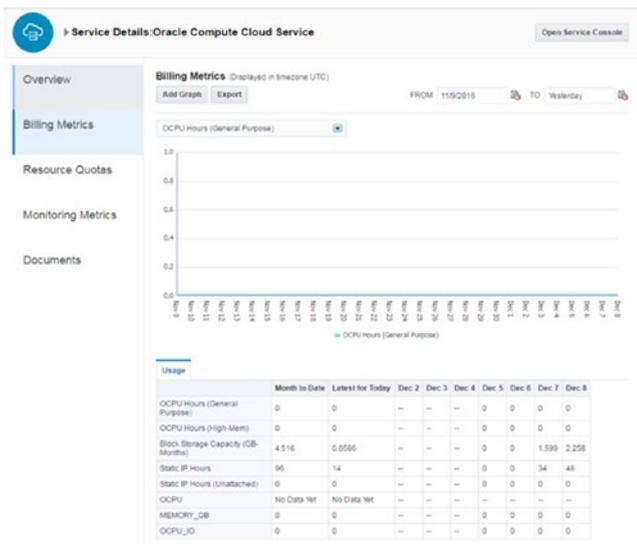


Figure 2-3. Billing Metrics

3. Check the quotas status of your service (Figure 2-4).

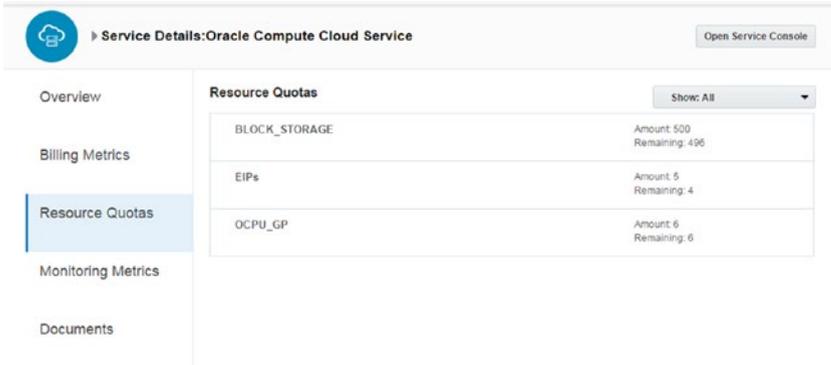


Figure 2-4. Resource Quotas page

Check your metrics with graphs. Graphs only show information when one or more instances are running (Figure 2-5).

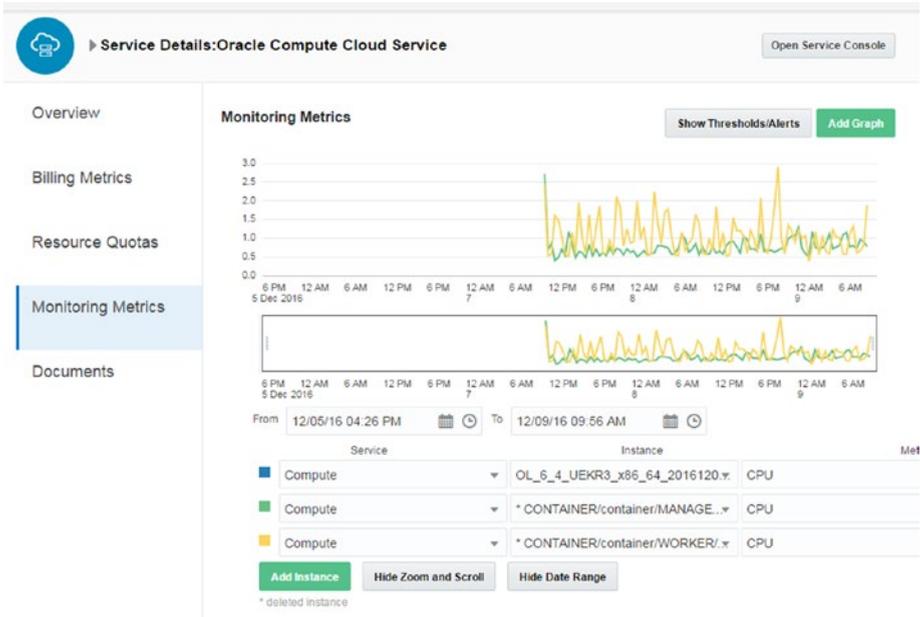


Figure 2-5. Monitoring Metrics

4. Find “Documents” in the Documents section (Figure 2-6).

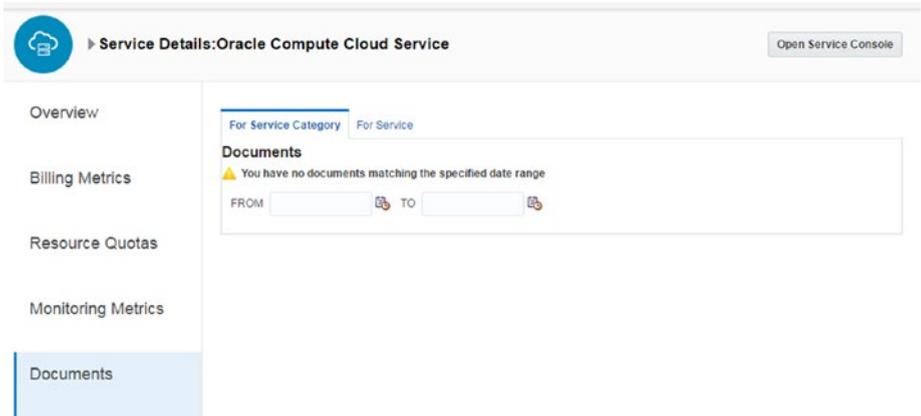


Figure 2-6. Documents

5. Create a service-on-service dashboard (Figure 2-7) and select the Compute option from that dashboard.

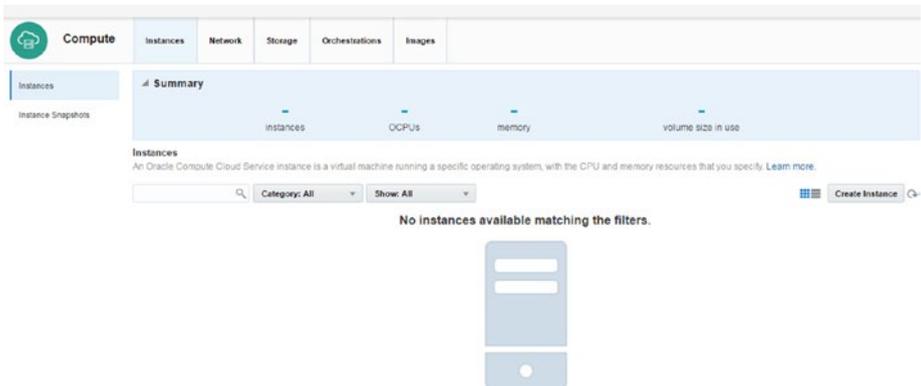


Figure 2-7. Instances dashboard

6. Select Image from the following cloud images. Custom or ready images can also be downloaded from Oracle Market Place (Figure 2-8).

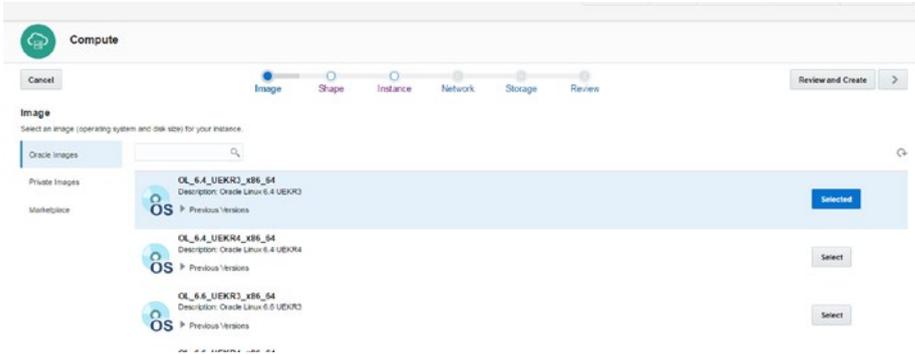


Figure 2-8. Image page

7. Select the operating system version (Figure 2-9).



Figure 2-9. Image selection

8. Push the Selected button (Figure 2-10).

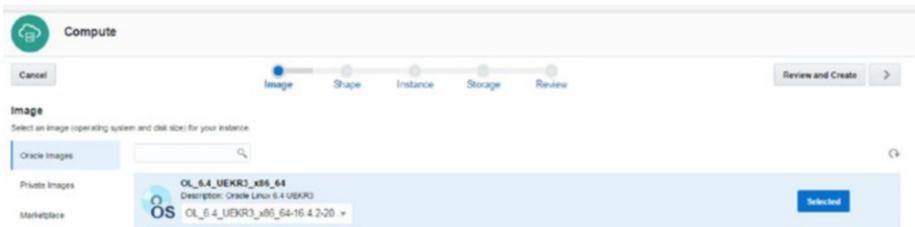


Figure 2-10. Selected button

9. Select the shape for your instance. Shape defines CPU and memory rate at Oracle Public Cloud. As seen, users can select CPU and memory through shape (Figure 2-11).

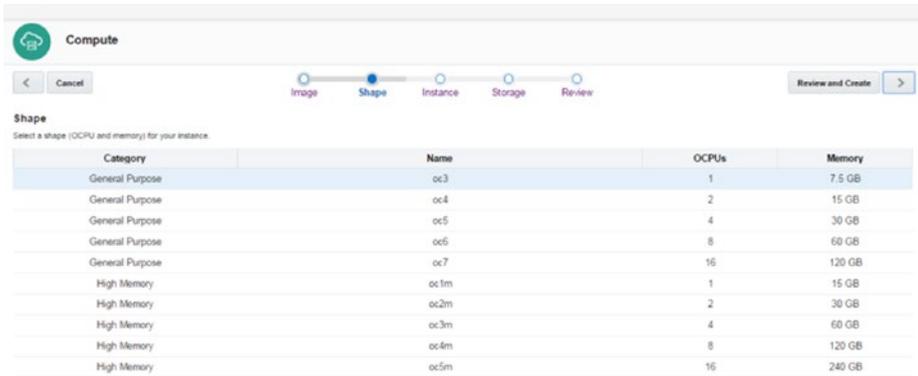


Figure 2-11. Compute ► Shape

10. Select the Instance page. This page contains all the information necessary for creating a service (Figure 2-12).
 - *Name*: Machine name.
 - *Label*: The name that will appear to outside users.
 - *Description*: Any description for understanding the creation of the machine.
 - *Tags*: Any tags for using the machine.
 - *DNS hostname prefix*: If required, specify the DNS prefix.
 - *Public IP address*: This option allows users to assign IP address with such options as auto.
 - *Security*: Use this option to specify a security list.
 - *SSH Keys*: This option is used to specify SSH keys.

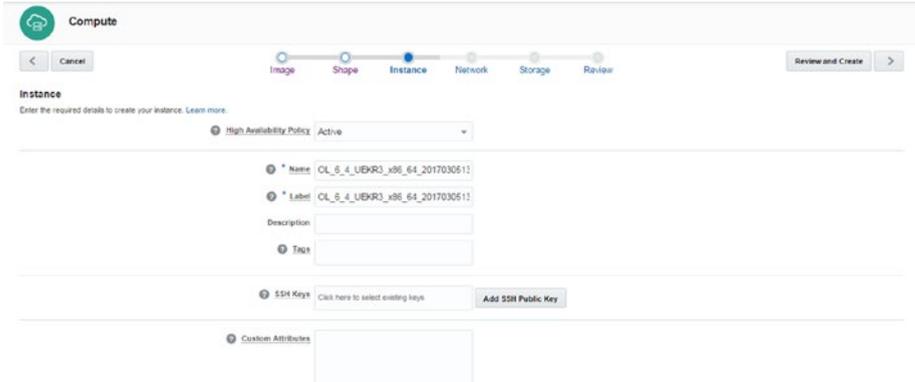


Figure 2-12. Instance configuration

Let's take a look at how to generate the public key (with PuTTY).

11. Click the Generate button (Figure 2-13).

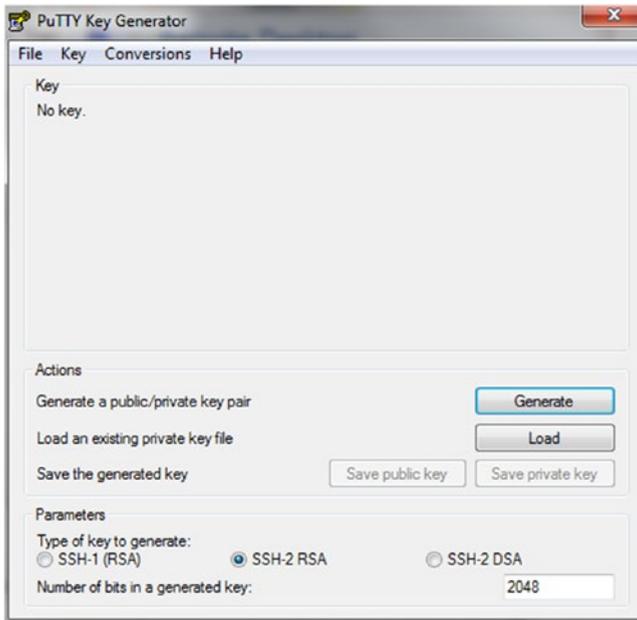


Figure 2-13. Generating the public key

12. Move the mouse to fill the bar. If you stop moving the mouse, the generator will stop the generating key (Figure 2-14).

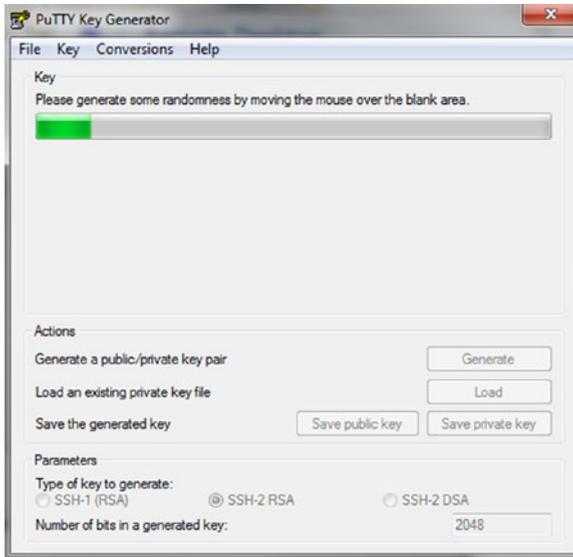


Figure 2-14. Generate key

13. Save private and public keys for logging in to the cloud system (Figure 2-15). (Save private key is for building new services and the public key for accessing these from this machine.)



Figure 2-15. Enter passphrase key

14. Fill in the required locations (Figure 2-16).

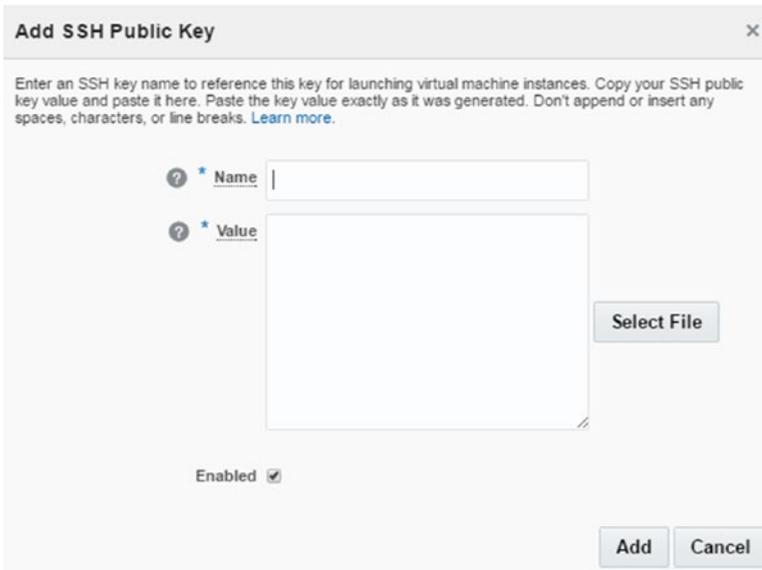


Figure 2-16. Add public key

15. Check your information (Figure 2-17).

The screenshot shows the 'Compute' console with the 'Instance' configuration step active. The progress bar at the top indicates the sequence: Image, Shape, Instance (current), Storage, Review. The 'Instance' section includes the following fields and options:

- High Availability Policy:** Active
- Name:** OL_6_4_UEKR3_x86_64_2016120905
- Label:** OL_6_4_UEKR3_x86_64_2016120905
- Description:** (empty text area)
- Tags:** (empty text area)
- DNS Hostname Prefix:** (empty text area)
- Public IP Address:** Auto Generated
- IP Networks:** Click here to select existing IP networks. [Create IP Network](#)
- Security Lists:** Click here to select existing lists. [Create Security List](#)
- SSH Keys:** 123 x. [Add SSH Public Key](#)
- Custom Attributes:** (empty text area)

The bottom screenshot shows the 'Network' configuration step. The progress bar indicates: Image, Shape, Instance, Network (current), Storage, Review. The 'Network' section includes the following fields and options:

- DNS Hostname Prefix:** (empty text area)
- Public IP Address:** Auto Generated
- IP Networks:** Click here to select existing IP networks. [Create IP Network](#)
- Security Lists:** Click here to select existing lists. [Create Security List](#)

Figure 2-17. Ready for SSH keys

16. If you want to specify an IP address prefix for your network, it can be an isolated network with multiple IP networks (Figure 2-18).

Create IP Network [X]

Enter the required details to create your IP network. Specify a name for your IP network and enter the IP address prefix for this network in CIDR format. [Learn more.](#)

? * **Name**

? * **IP address prefix**

? **IP exchange** Not Set ▼

Description

Create **Cancel**

Figure 2-18. IP configuration

17. Select Create Security List and specify the configuration for your traffic (Figure 2-19).
 - *Name*: Describe your identity.
 - *Inbound Policy*: Controls internal requests. Drop packets deny requests and accept packets allow them.
 - *Outbound Policy*: Controls external request policy.
 - *Description*: Add any notes here.

Create Security List [X]

Enter the required details to create your security list. A name identifies your security list. Security rules and virtual machine instance configurations reference the name entered here. [Learn more.](#)

? * **Name**

? * **Inbound Policy** Deny (Drop packets, no reply) ▼

? * **Outbound Policy** Permit (Allow packets) ▼

Description

Create **Cancel**

Figure 2-19. Create Security List

18. Select the Add SSH Public key button to add new SSH keys. (Oracle Cloud must connect with asynchronous encryption, thus users have to create public and private keys through PuTTY.)

- *Name*: New SSH key name.
- *Value*: Generated SSH keys with third-party tools, such as PuTTYgen or existing key-generating software on Unix platforms, such as ssh-keygen. To download PuTTY and PuTTYgen, consult www.chiark.greenend.org.uk/~sgtatham/putty/download.html.

■ **Note** Be sure to add SSH keys; otherwise, you cannot log in to your instance. SSH keys cannot be changed using the GUI after the Wizard finishes.

19. Set storage status (Figure 2-20).

Boot Drive: Normally, boot volume is set and used to boot your instance.

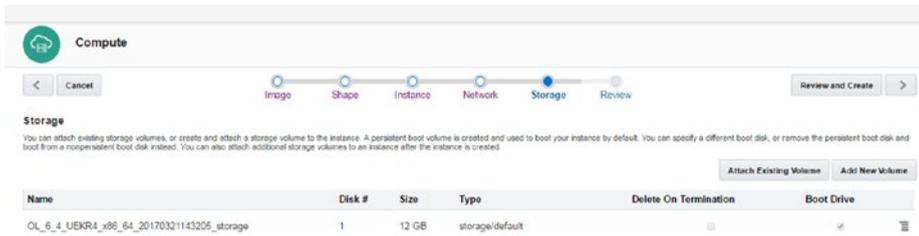


Figure 2-20. Storage

20. Existing storage can be added with this menu (Figure 2-21). (If you have added storage, you must attach existing storage as below.)

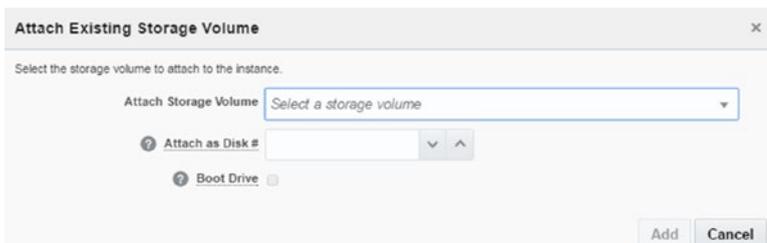


Figure 2-21. Attaching existing storage

- 21. New storage can be added with this menu (Figure 2-22). (Customers must add new disks to enable high-capacity storage.)

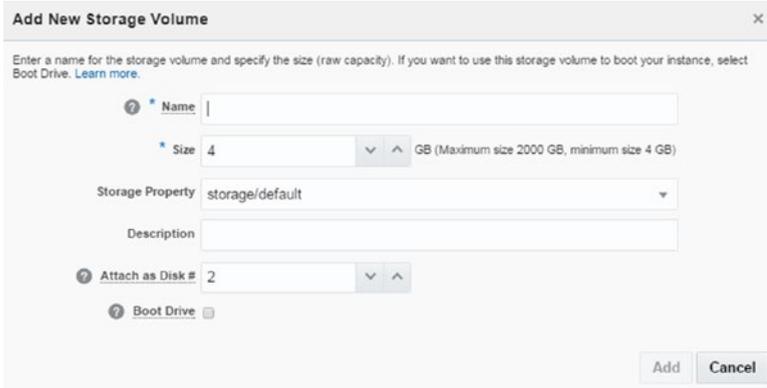


Figure 2-22. New cloud storage

- 22. On the Review page of the Wizard, check all your information before clicking the Create button and creating a compute instance (Figure 2-23).

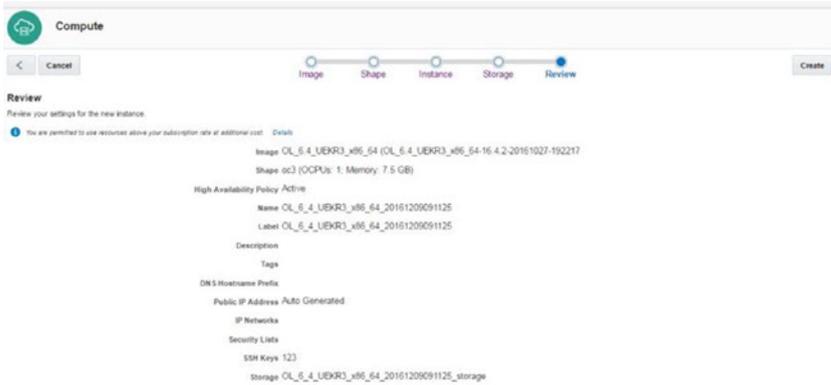


Figure 2-23. Review

Now the compute instance is running and ready for other operations (Figure 2-24).

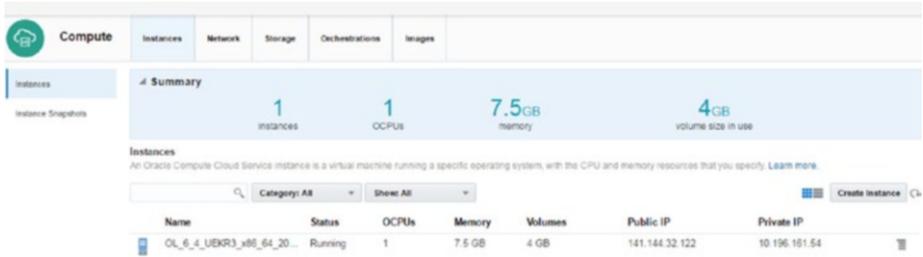


Figure 2-24. Available instance

23. After clicking the little computer symbol in front of your instance name, you can see and change the details of the compute instance (Figure 2-25).

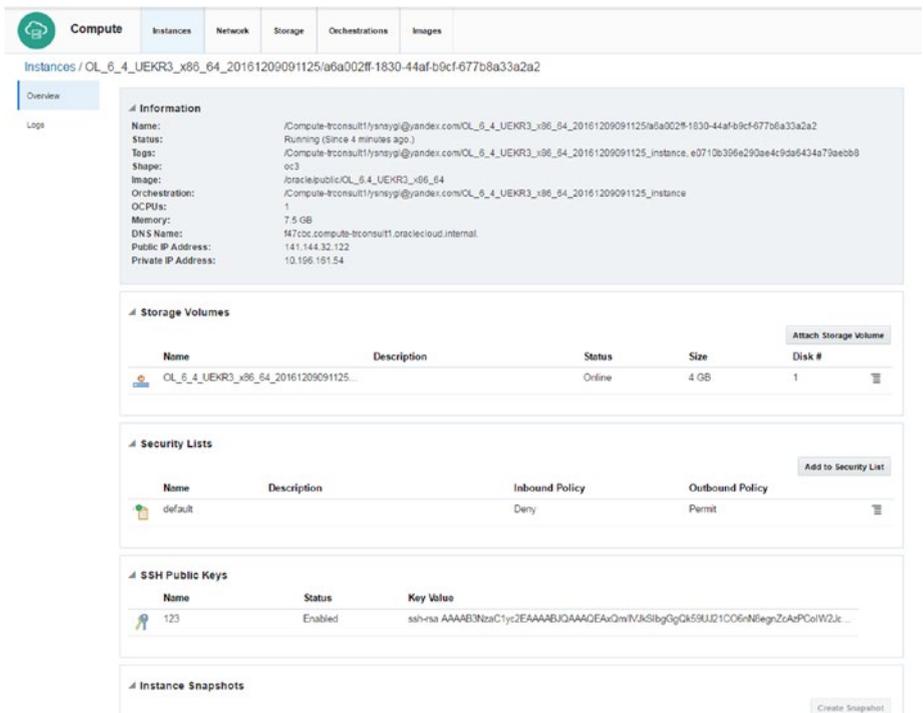


Figure 2-25. Instance summary

- When enabled, the Logs page displays any logs provided, such as the Console Log (Figure 2-26).

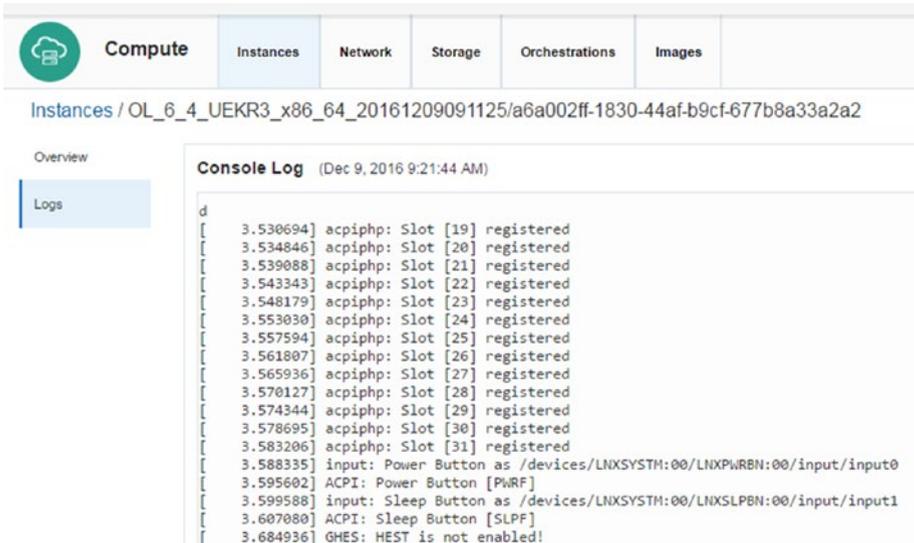


Figure 2-26. Instance logs

Connecting Compute Node

Everything is done, and now we are at the point of accessing our compute node. First, we must do some configuration related to security issues: source and target security lists that aim to connect users to the compute node from the public Internet.

PuTTY or a similar SSH client is required for connecting Linux machines. Remote Desktop can be used for Windows-based instances. The following steps assume the use of SSH (port 22). If Remote Desktop is used, follow the same steps but use port 3389 instead.

- Make sure that you are on the Compute Service Console. After clicking the Network tab, select Create Security Rule from Security Rule section (Figure 2-27).

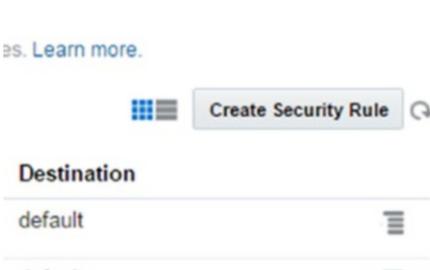


Figure 2-27. Creating security rule

- Specify the security list that you initially selected for your new compute instance. We will grant access (for example, for port 22 from the Internet) to this list. Because this security list is connected to your compute instance, the compute instance will be accessible on, for example, port 22 (Figure 2-28). (Specifically, you can select public Internet from the Security IP List.)

Figure 2-28. Security rule

■ **Note** If you do not specify security rules, you cannot connect to the instance.

- Now, we should be able to connect to our system. Make a note of the compute instance public IP address. Let's start with PuTTY and enter your public IP address under Host Name (Figure 2-29).

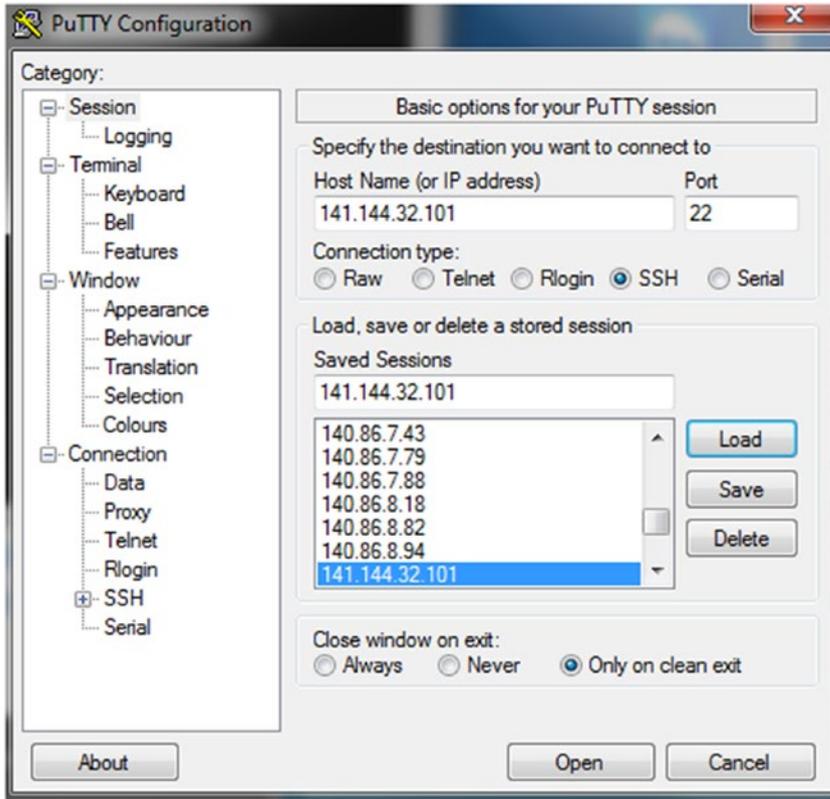


Figure 2-29. PuTTY connection

4. Enter “opc” in the Auto-login username box (Figure 2-30). (Enter “opc,” if you want to become root with SUDO.)

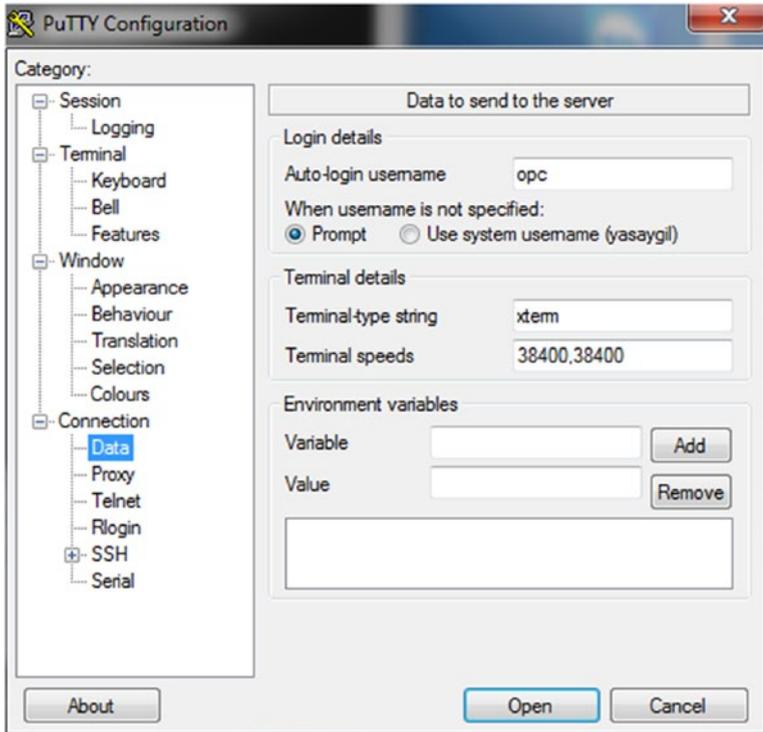


Figure 2-30. Username in Data

5. Navigate to the Connection-SSH-Auth category and select the private key file that was generated when creating the public key file (Figure 2-31).

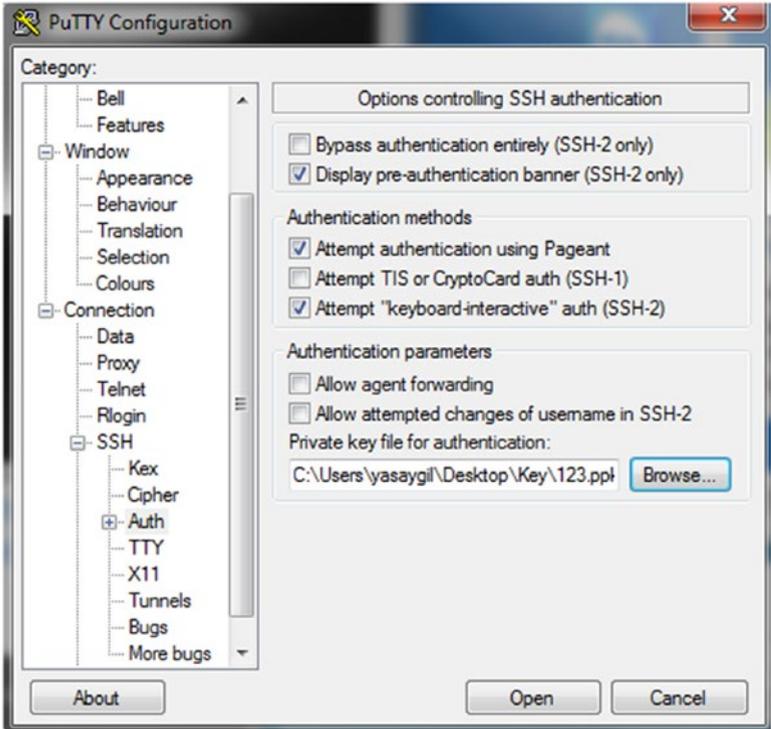


Figure 2-31. Configuring private key

6. For ease of use, click the Session category of PuTTY and save the configuration for future use. After this, click Open (Figure 2-32).

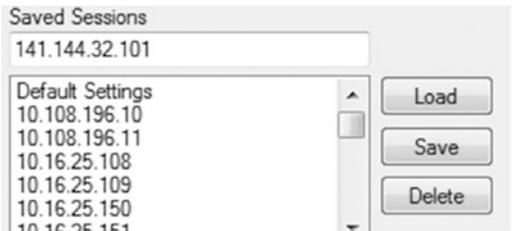


Figure 2-32. IP configuration

7. Having entered a passphrase during the generation of the private key file, you must enter it now and press Enter (Figure 2-33).

```
Using username "opc".
Authenticating with public key "123"
Passphrase for key "123":
[opc@bd7f8a ~]$
[opc@bd7f8a ~]$
[opc@bd7f8a ~]$
[opc@bd7f8a ~]$ ls
[opc@bd7f8a ~]$ cd ..
[opc@bd7f8a home]$
```

Figure 2-33. Connection with PuTTY

Removing Oracle Compute Service

You have learned how to install the compute node, but I haven't discussed how to remove this service from the cloud. To remove the compute node, you have to remove the relevant orchestration entries from the Orchestration tab. All services are started with orchestrations. When you drop the relevant orchestration, the items created by this orchestration (disks, network, CPU, memory, etc.) will be deleted. This is a unique feature because, normally, other cloud service providers do this removal via a machine's remove section.

Let's see how removal is done.

1. Click the orchestration service tab and click to stop the orchestration line for your cloud instance that has the extension “_Master” in the name (Figure 2-34).

Name	Status	Created	Actions
OL_6_4_UEKR3_x86_64_20161209091125_m...	Ready	Dec 9, 2016 9:19:32 AM	View, Stop, Refresh Instance, Download
OL_6_4_UEKR3_x86_64_20161209091125_m...	Ready	Dec 9, 2016 9:19:32 AM	
OL_6_4_UEKR3_x86_64_20161209091125_m...	Ready	Dec 9, 2016 9:19:32 AM	
test_instance	Ready	Dec 13, 2016 10:58:50 AM	

Figure 2-34. Orchestration

2. You will receive a warning that all objects will be deleted and that you should confirm your decision to delete (Figure 2-35).

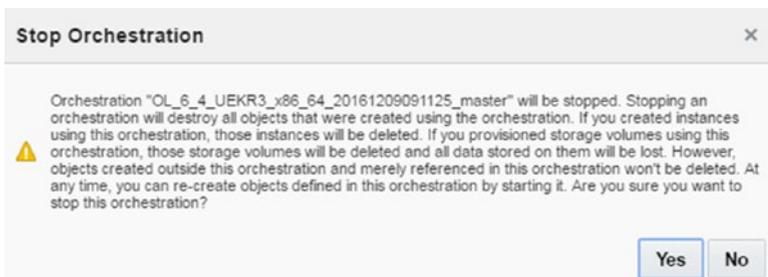


Figure 2-35. Stopping orchestration

3. After clicking Yes, this information will be at the top side (Figure 2-36).

● Successfully sent request to stop orchestration "OL_6_4_UEKR3_x86_64_20161209091125_master".

Figure 2-36. Orchestration request

4. Click the storage service page and view the storage status (Figure 2-37).

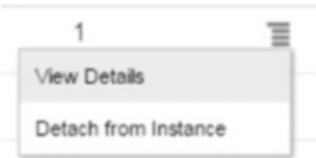


Figure 2-37. Orchestration detach

5. Click Yes under Detach Storage Volume (Figure 2-38).



Figure 2-38. Detach confirmation

6. Now, the disks are detaching from the compute instance (Figure 2-39). (This step stops the instance.)

● Detaching storage volume *

Figure 2-39. Detach progress

Linux Disk Adding

Mission-critical operations may require increasing disk size day by day. Therefore, disks must be added to avoid any service interruption. Oracle Cloud offers rapid provisions for adding new disks that are used for different purposes. To add disks quickly, do the following:

1. Use the Oracle Cloud interface to create new storage devices and add them to the compute instance.
2. Log in to your system, as follows:

```
Login as: opc
Authenticating with public key "rsa-key-20161201"
[opc@d5f7f3 ~]$
```

3. Check the new device with the `ls` listing—command. (After adding the new disk, you will see `xvdc`.)

```
[opc@d5f7f3 ~]$ ls /dev/xvd*
/dev/xvdb /dev/xvdb1 /dev/xvdb2 /dev/xvdc
```

4. Configure your disk.

```
[opc@d5f7f3 ~]$ sudo mkfs -t ext4 /dev/xvdc
mke2fs 1.43-WIP (20-Jun-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
1310720 inodes, 5242880 blocks
262144 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=4294967296
160 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000
```

```
Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

5. Mount the specific disk.

```
[opc@d5f7f3 ~]$ sudo mount /dev/xvdc /mnt
```

6. Enter details on the fstab file.

```
[opc@d5f7f3 mnt]$ sudo vi /etc/fstab
/dev/mapper/vg_main-lv_root / ext4 defaults 1 1
UUID=7a51e0aa-31d2-48a0-91d9-783a8b9154d8 /boot ext4 defaults 1 2
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
disk /mnt disk defaults 0 0
```

7. Check the new device.

```
[opc@d5f7f3 mnt]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/vg_main-lv_root
                7.3G  885M  6.1G  13% /
tmpfs           3.7G   0  3.7G   0% /dev/shm
/dev/xvdb1      477M   63M  385M  14% /boot
/dev/xvdc       20G   45M  19G   1% /mnt
```

Oracle Market Place

Many applications are developed by independent software vendors and system integrators. Broadly speaking, they are seeking to promote their own products in the IT sector, thus Oracle is offering a market place from which to develop new business in the cloud. Oracle Market Place makes use of the marketplace more accessible. Oracle Cloud products can be published to a dedicated distribution channel.

1. Click Create Instance (Figure 2-40).



Figure 2-40. Create Instance

2. Select Market Place (Figure 2-41).

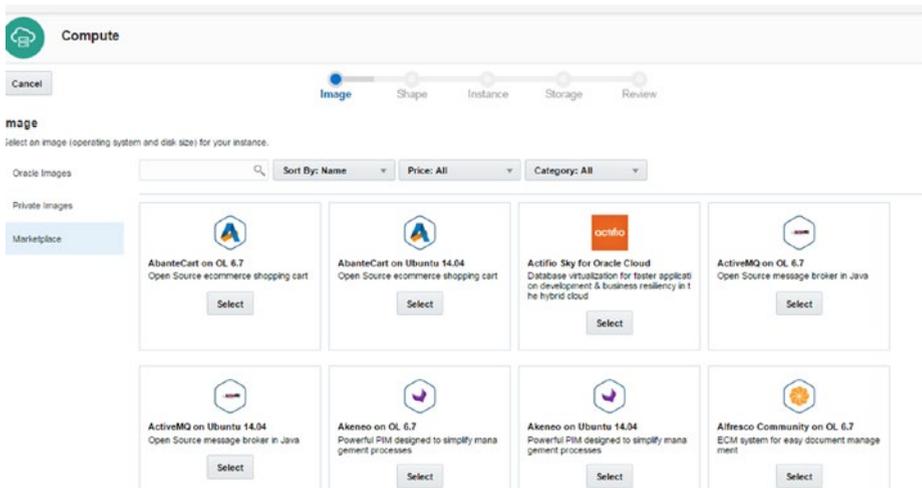


Figure 2-41. Market Place

3. For example, search Microsoft Windows for installing an image from Oracle Cloud Market Place (Figure 2-42).

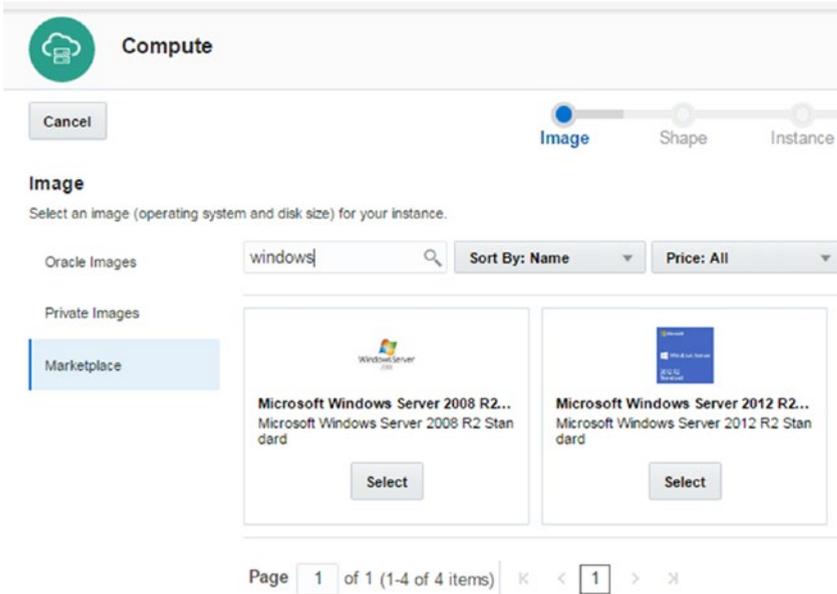


Figure 2-42. Market Place selection

4. Select the Windows Server 2012 image (Figure 2-43).

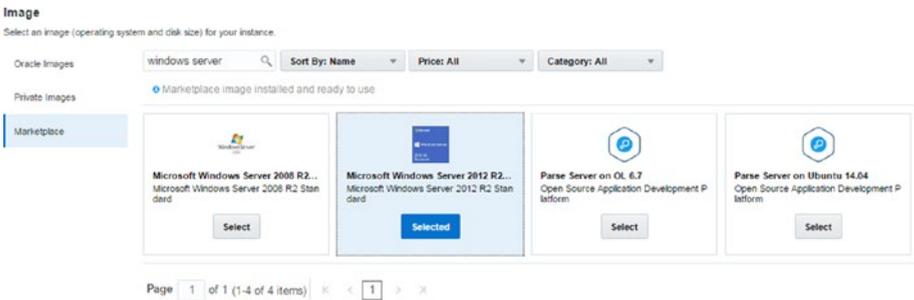


Figure 2-43. Selection

5. Accept the rules and regulations. (If you have selected images, you are accepting the terms under which a price will be charged; Figure 2-44.)



Figure 2-44. Agreement

6. Click the Install button to continue (Figure 2-44).

■ **Note** If you select Review and Create, installation will finish, and you will not be able to connect to your environment, as you have not provided a password for the Administrator user.

Instead, click the Next button (Figure 2-45).



Figure 2-45. Next button

7. Select OCPU and memory size (Figure 2-46).



Figure 2-46. Shape

8. Fill in blanks with the necessary information (Figure 2-47).

your instance. [Learn more.](#)

High Availability Policy Active

Name windows

Label windows

Description

Tags

SSH Keys [Click here to select existing keys](#) **Add SSH Public Key**

RDP Enabled

Administrator Password |

Custom Attributes {
 "enable_rdp": true
}

Figure 2-47. Instance configuration

Note Don't forget to enter an Administrator password, or you will not be able to log in to the machine.

9. Fill in the blanks with the necessary information (Figure 2-48).

Network

Configure network settings. [Learn more.](#)

DNS Hostname Prefix

Public IP Address Auto Generated

IP Networks [Click here to select existing IP networks](#) **Create IP Network**

Security Lists [Click here to select existing lists](#) **Create Security List**

Figure 2-48. Network

10. Check and update your storage status (Figure 2-49).

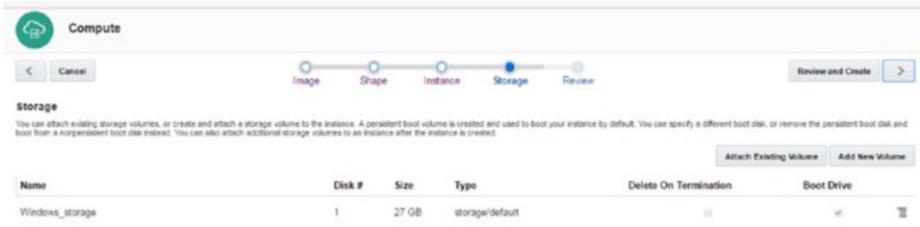


Figure 2-49. Storage selection

11. Check your configuration summary (Figure 2-50).

■ **Note** Check your summary carefully, because you may not be able to repeat the settings, owing to some improper configurations.

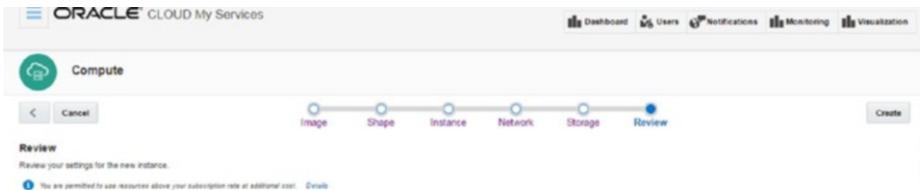


Figure 2-50. Review

12. A confirmation e-mail will be sent by Oracle to verify your e-mail address (Figure 2-51).

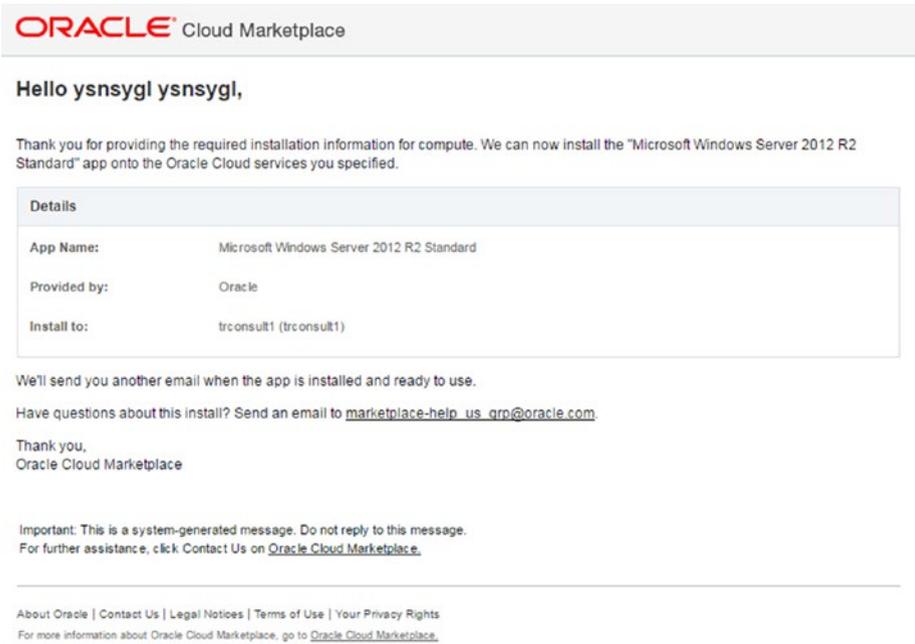


Figure 2-51. Confirmation e-mail

13. Application service e-mail will be sent by Oracle to your e-mail address (Figure 2-52).

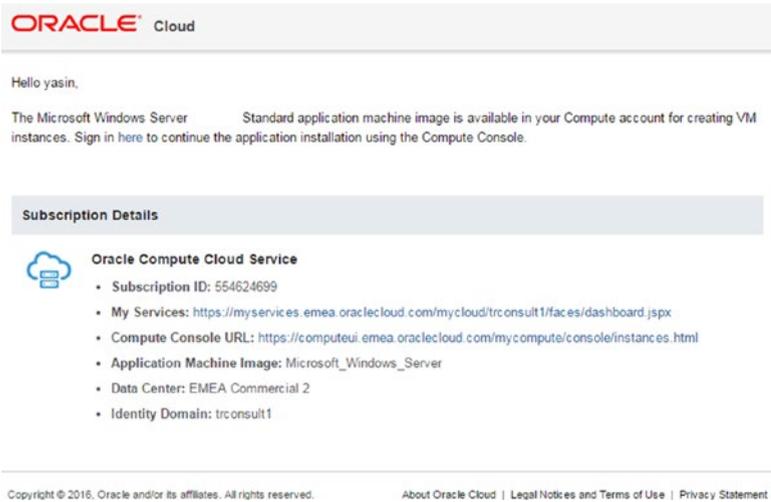


Figure 2-52. Confirmation e-mail

14. Your application is now ready to use in our case, on a Windows machine. Now, try to connect to the system.
15. Connect to a Windows machine through the Remote Desktop Protocol (RDP; Figure 2-53). (Before connecting to the Windows machine through RDP, add the security rule for port 3389.)

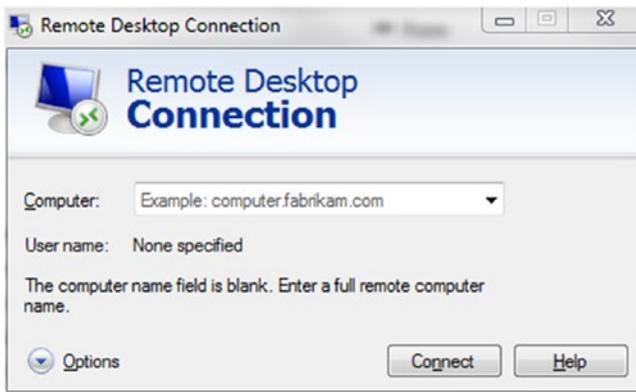


Figure 2-53. Remote Desktop Protocol

16. Enter your username (Administrator) and your password (Figure 2-54).



Figure 2-54. RDP credentials

- 17. Note the certification and verification for logging (Figure 2-55).



Figure 2-55. RDP verification

- 18. Finally, the machine is connected through RDP (Figure 2-56).

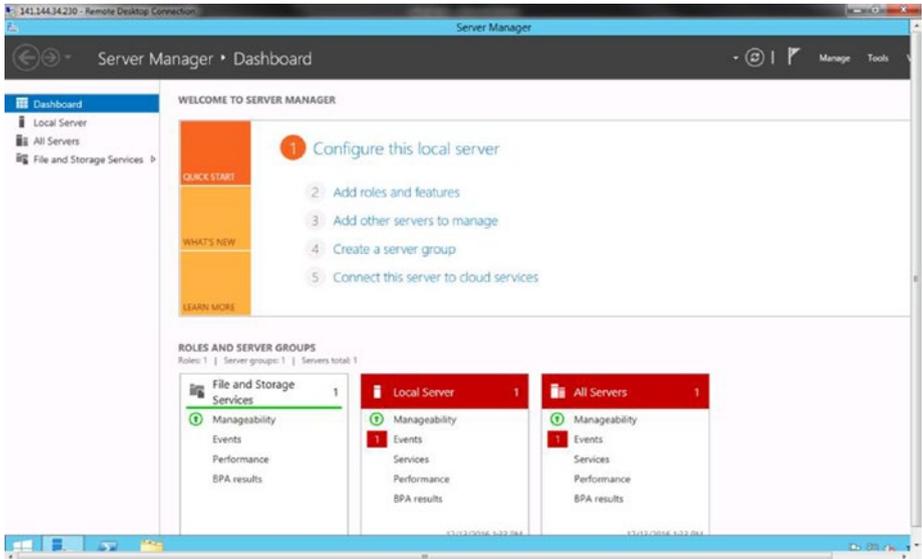


Figure 2-56. Windows server

Adding a Disk to a Windows Machine

We will now look at adding storage to a Windows machine, which is one of the most in-demand operations and can be initiated as follows:

1. Add a new disk to the compute instance from the Oracle Cloud interface (Figure 2-57). (Add a new disk to the compute instance either by following the provided compute provision steps or from the compute cloud dashboard.)

Add New Storage Volume [X]

Enter a name for the storage volume and specify the size (raw capacity). If you want to use this storage volume to boot your instance, select Boot Drive. [Learn more.](#)

Name

Size GB (Maximum size 2000 GB, minimum size 12 GB)

Storage Property

Description

Attach as Disk #

Boot Drive

Add **Cancel**

Figure 2-57. Adding storage volume

2. Find Server Manager on the Windows machine (Figure 2-58).

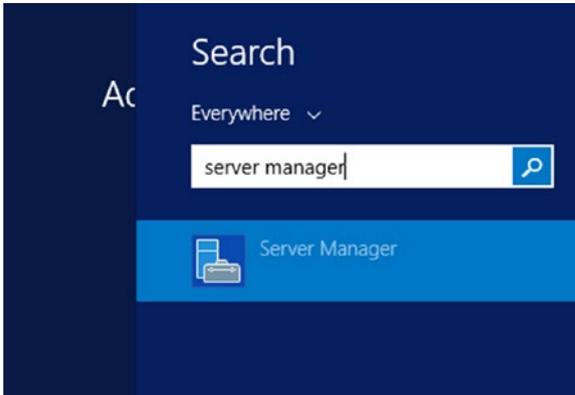


Figure 2-58. Search server manager

3. Find File and Server Manager from Dashboard (Figure 2-59).

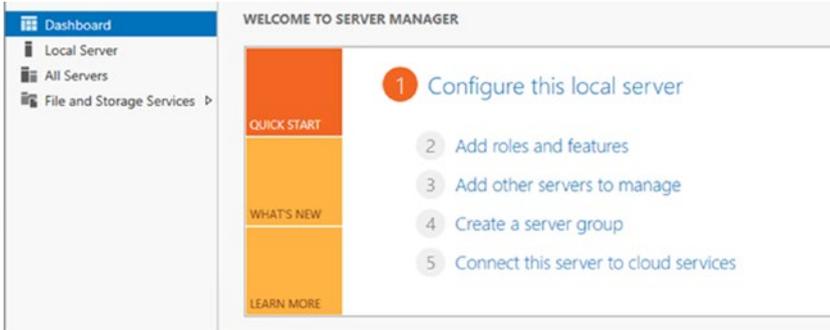


Figure 2-59. Configuring Server Manager

4. Check your new device from the Disks section (Figure 2-60).

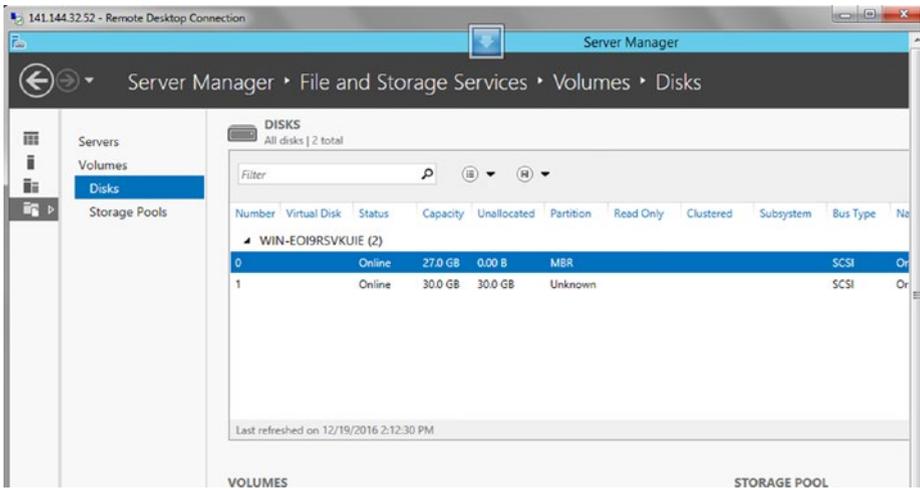


Figure 2-60. Disks manager

5. Find New Volume Wizard (Figure 2-61).

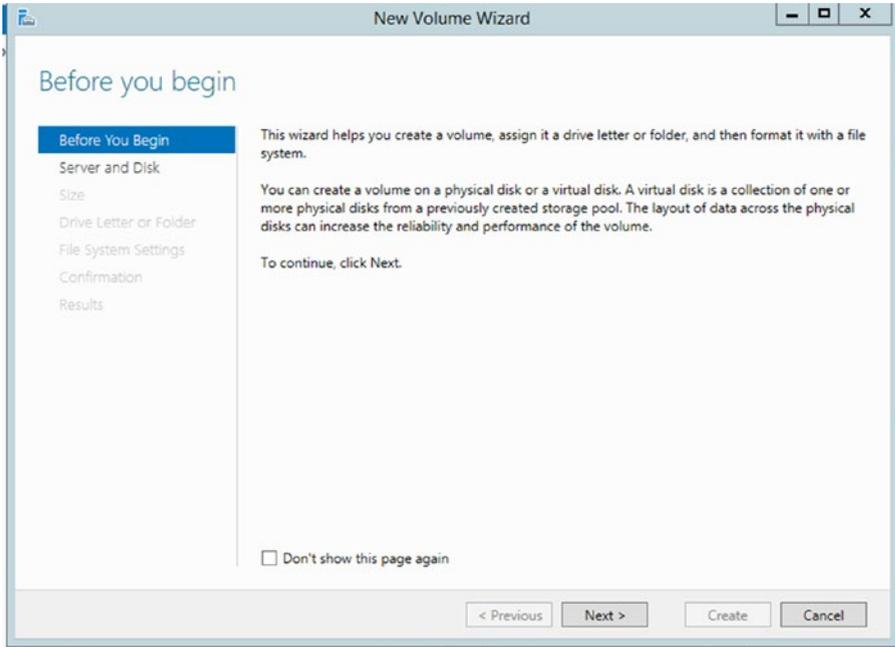


Figure 2-61. *New Volume Wizard*

6. Check your device on Wizard (Figure 2-62).

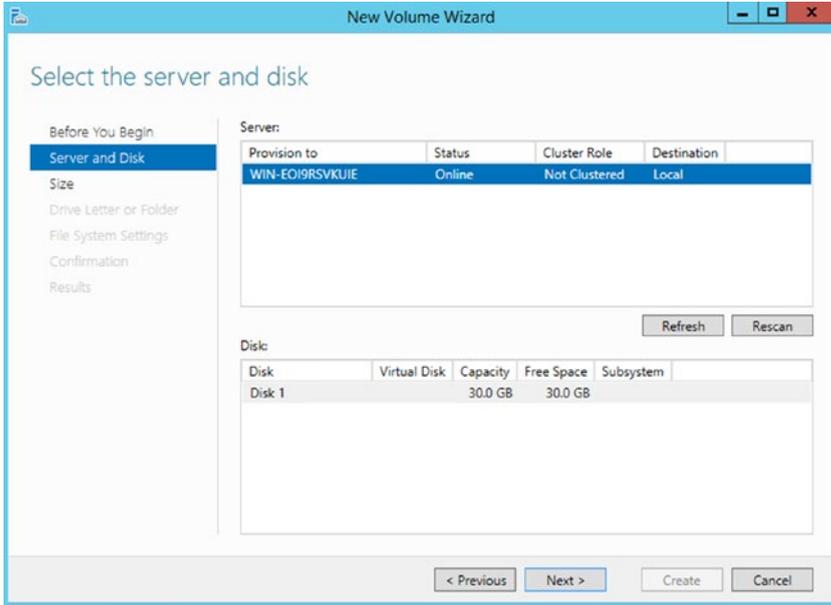


Figure 2-62. Server and disk

7. Specify your disk size (Figure 2-63).

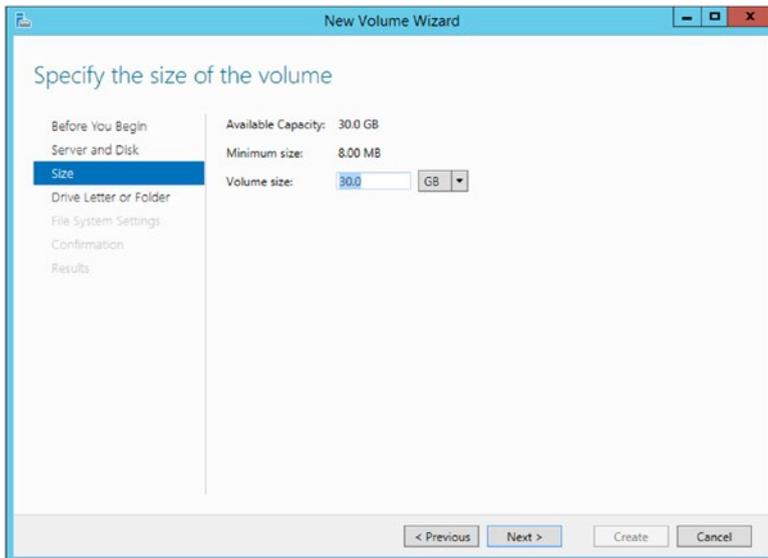


Figure 2-63. Specifying size

8. Assign it to a drive (Figure 2-64).

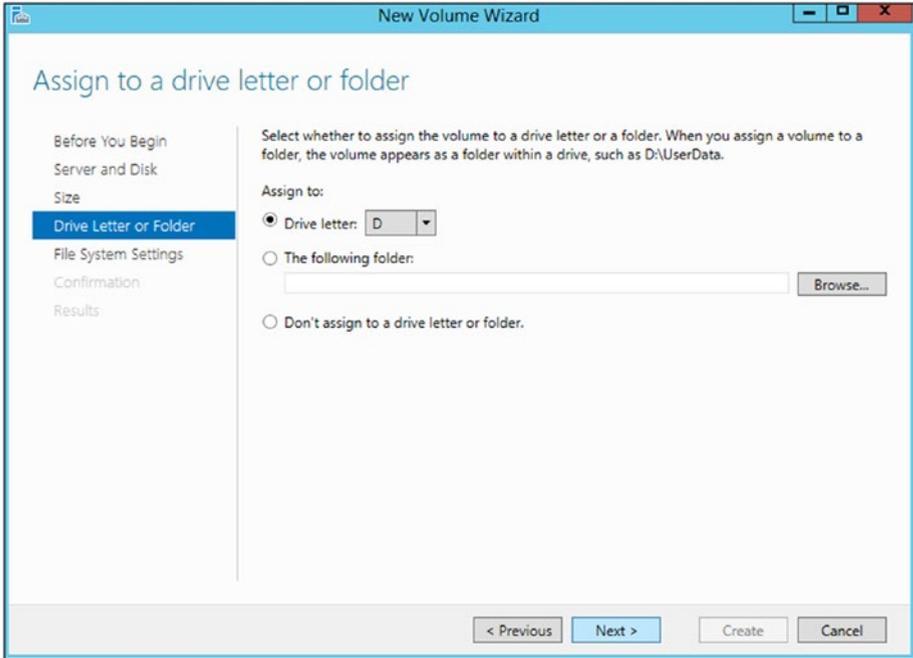


Figure 2-64. Drive letter

9. Confirm the settings (Figure 2-65).

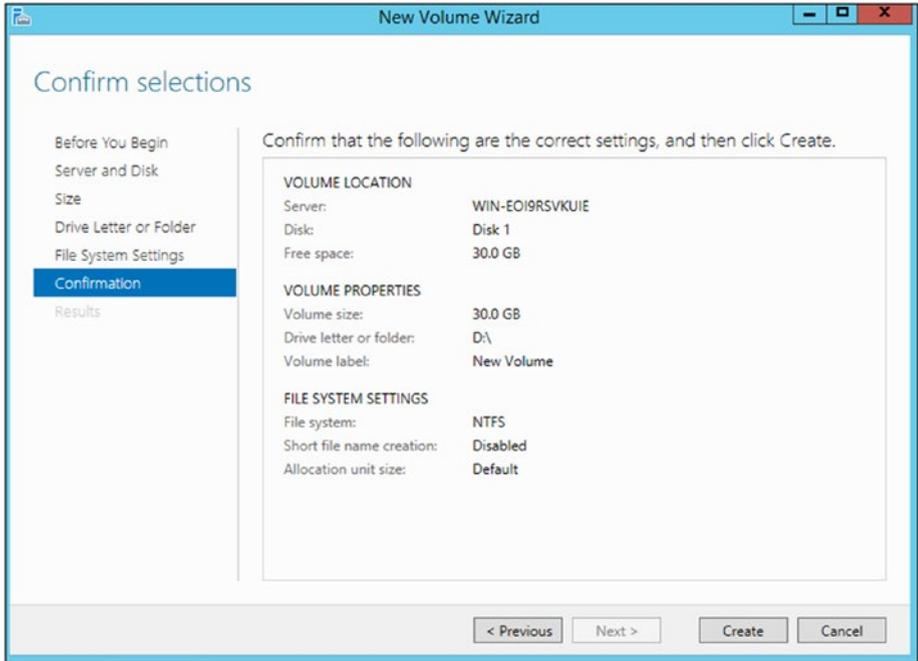


Figure 2-65. Confirmation

10. Click volume to find Manage Drive Letter and Access Paths... (Figure 2-66).

Manage Drive Letter and Access Paths...

Figure 2-66. Manage Drive Letter...

11. Enter the drive letter and browse the access paths (Figure 2-67).

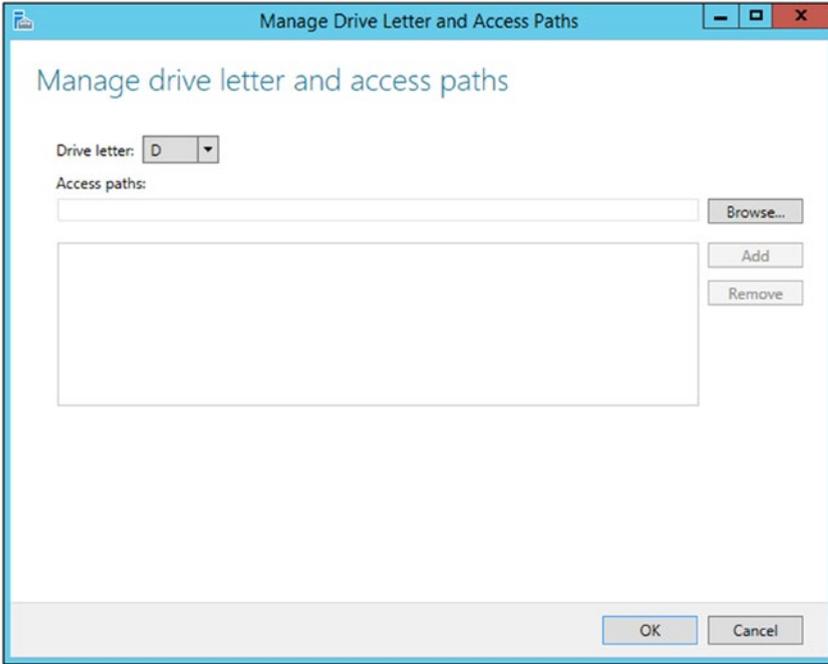


Figure 2-67. Manage drive letter

12. Check your new volumes (Figure 2-68).

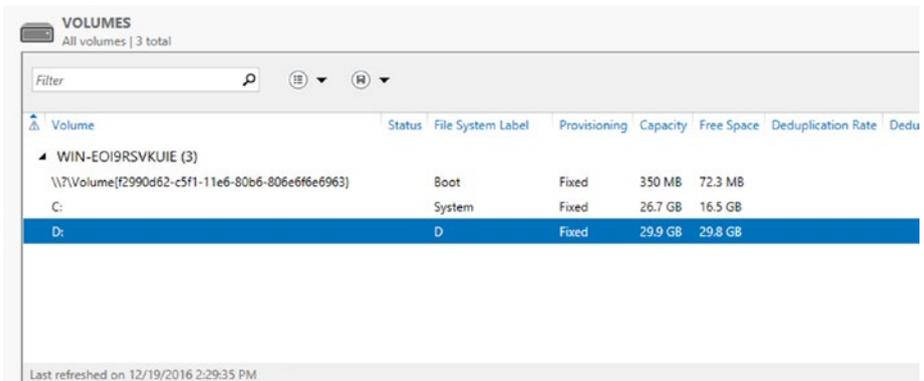


Figure 2-68. Volume

13. Check your new device on the compute node (Figure 2-69).

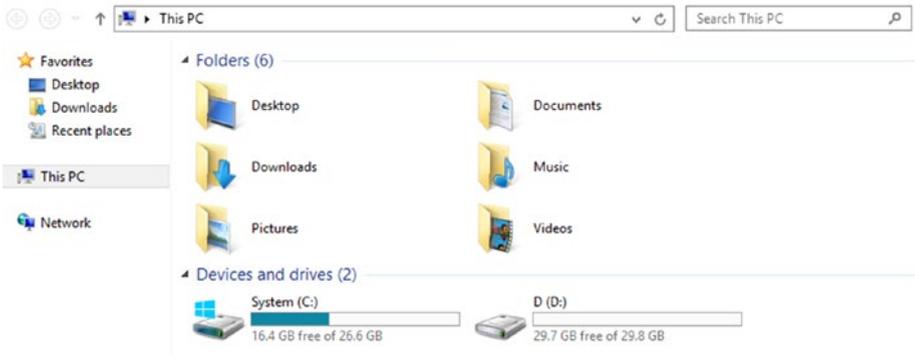


Figure 2-69. Computers

Network

Security is provided at a high level, so that a user cannot engage in any undesirable behavior, owing to the fact that security is designed for, and supported at, every level. (Network security is a real problem, and knowing that this is a critical issue, Oracle seeks to provide secure cloud for customers.) To ensure security, you can specify which IP addresses to connect to the machine, or you can open public Internet for cloud applications. Both scenarios are available from Oracle Cloud.

The network settings are applied to all machines on Oracle Cloud.

1. Click Security Rules under the Network tab (Figure 2-70).

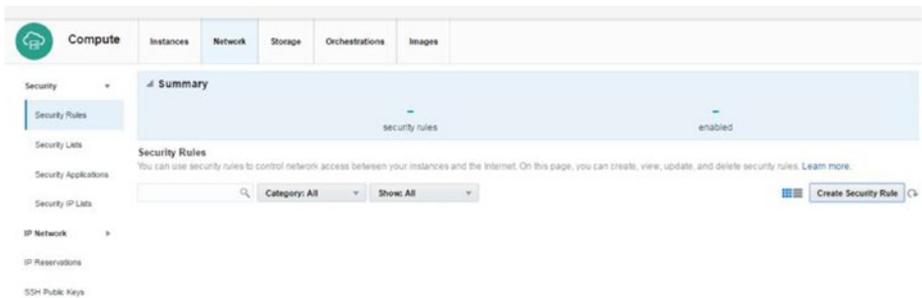


Figure 2-70. Network

2. Security Rule is used to specify security lists for source and target machines. For example, you can select public Internet as a source and this can reach your machine. Security applications can be selected by port or port-range. Security Rule is enabled by default, but it can be modified (Figure 2-71) by amending the following:
 - *Status*: Whether or not the rule is available
 - *Security application*: Selects the application
 - *Source*: Selected from a security list or security IP list
 - *Target*: Can be selected from a security list or security IP list
 - *Description*: Allows comments to be added

Create Security Rule ✕

Enter the name of your security rule. The rule is enabled by default, but you can disable it until you are ready to use it. You must specify the security application and the source and destination security lists or security IP lists to which the security rule will apply. [Learn more.](#)

Status: Enabled

Security Application: all

Source:

- Security List
 - default
- Security IP List
 - instance

Destination:

- Security List
 - default
- Security IP List
 - instance

Description:

Create Cancel

Figure 2-71. Create Security Rule

3. Let's check out our rule on the security list (Figure 2-72).

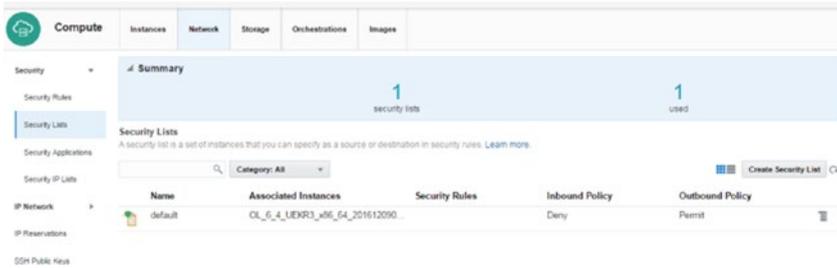


Figure 2-72. Security list

4. If any need arises for changing the default for inbound and outbound network traffic behavior, network configuration can be updated (Figure 2-73).
 - *Name*: Specify name.
 - *Inbound*: This option can be selected: Deny or Reject.
 - *Outbound*: These options can be selected: Deny, Reject, or Allow.
 - *Description*: Comments can be added about it.

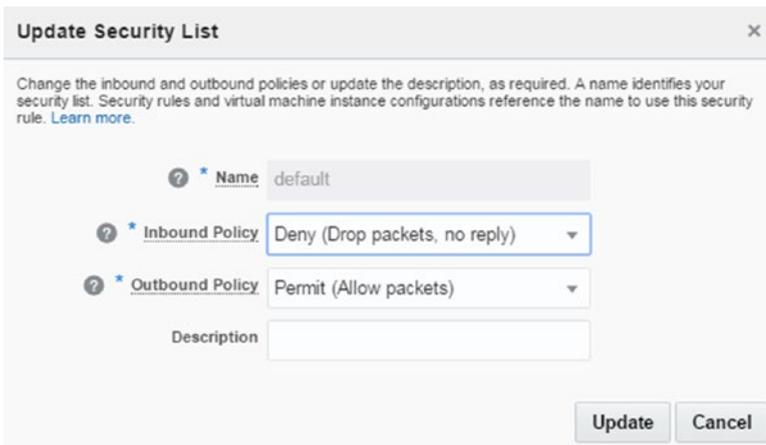


Figure 2-73. Update security rule

5. Open Security Applications to ensure the desired port type and port range. This option allows users to employ applications through a rule. In fact, it is this security list that allows users to open the port range (Figure 2-74).

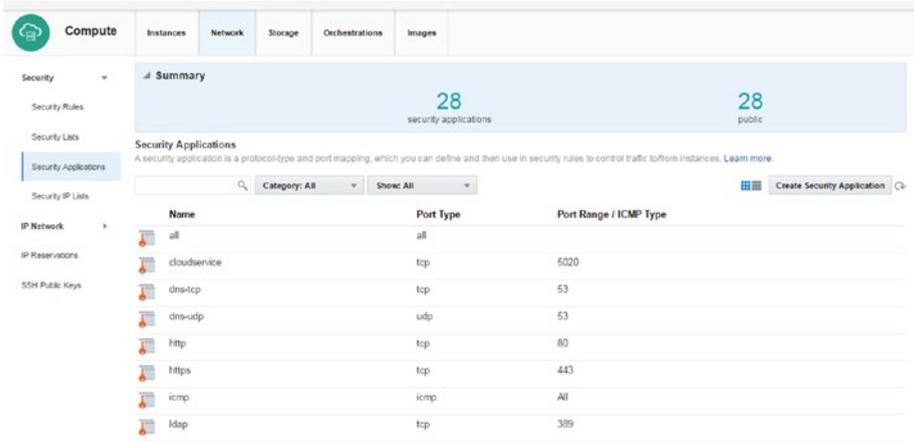


Figure 2-74. Summary

6. Specify applications by creating a new one. This option shows applications details, including name, port type, and port range. (Figure 2-75).
 - *Name*: Specify a name.
 - *Port Type*: Select the protocol which is to be used.
 - *Port Range Start*: Specify the number of which port is to start.
 - *Port Range End*: Specify the number of which port is to end.
 - *Description*: Add comments here.

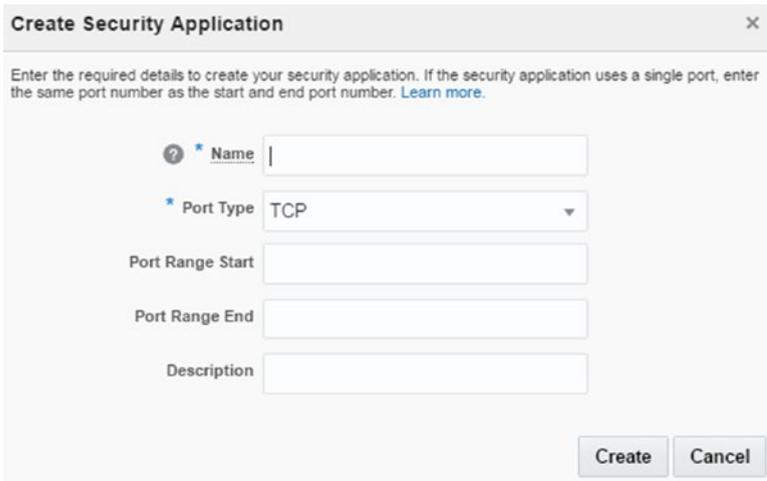


Figure 2-75. Create Security Application

- Specify the application security IP list (Figure 2-76). (The Security IP list shows available IP subnets or IP addresses that are external to instances.)

■ **Note** The IP list can include a maximum of 100 entries.



Figure 2-76. Security IP list

- Specify new security IP addresses that are to be enabled for the cloud network (Figure 2-77).
 - Name*: Specify name.
 - IP List*: Specify IP with comma-separated list, in order to admit an external host to the service.
 - Description*: Comments can be added here.

Create Security IP List [X]

Enter a name for the security IP list. Security rules use this name to reference this list. The security IP list is a comma-delimited list of either IPv4 addresses or IP subnets, with or without subnet masks. [Learn more.](#)

? * **Name**

? * **IP List**

Description

Create Cancel

Figure 2-77. Create Security IP List

9. IP Network allows you to build an IP subnet and, during the creation of the IP network, you can specify an IP prefix. An instance assigned to IP Network can be assigned an IP address in the subnet. Check your IP networks on Oracle Cloud (Figure 2-78).

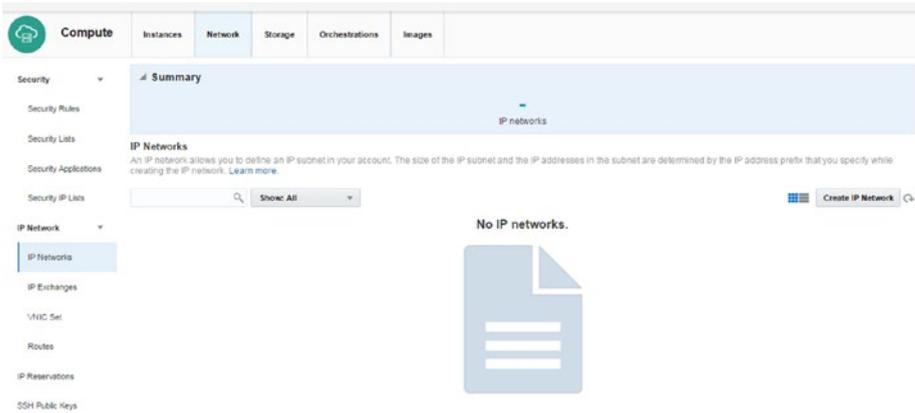


Figure 2-78. IP Networks

10. Specify IP Networks configurations, as follows:
 - *Name*: Specify a name.
 - *IP Address Prefix*: Enter the CIDR prefix format for the IP.
 - *Description*: Comments can be entered here.
11. IP Network Exchanges allow IP networks to be exchanged with one another. Check your IP address for exchanging (Figure 2-79).

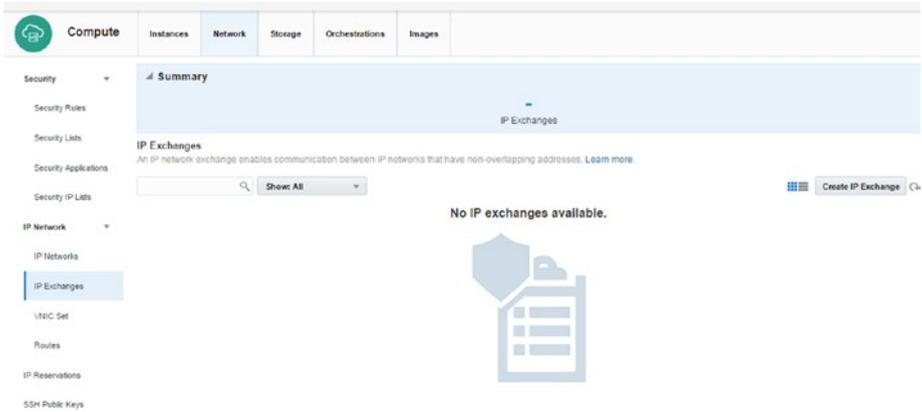


Figure 2-79. IP Exchanges

12. Specify the IP address for creating and updating the network (Figure 2-80).
 - *Name:* Specify a name.
 - *Description:* Comments can be entered here.



Figure 2-80. Create IP Exchange

13. VNIC Set (Virtual NIC set) collects multiple VNICs, so with this feature, you can specify the next destination on route. Check the VNIC setting in the VNIC Set tab (Figure 2-81).

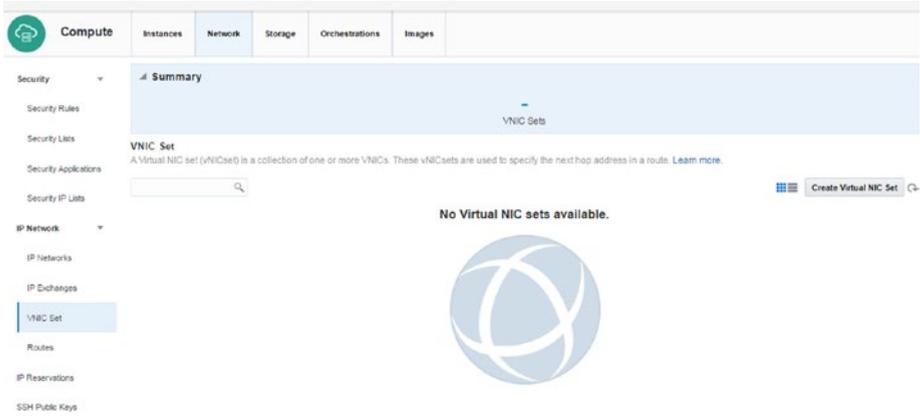


Figure 2-81. VNIC Set

14. Please specify the VNIC Set name to find a specific VNIC set (Figure 2-82).



Figure 2-82. Create Virtual NIC Set

15. If a specific route is set by your system, apply it to cloud network settings.
16. Specify the route name, IP address, and VNIC Set to create a new route (Figure 2-83).

Create Route

Enter the required details to create a route. You must specify an IP address prefix and a vNICset for the next hop. [Learn more.](#)

Name

Administrative Distance

IP Address Prefix

Next Hop vNIC Set

Description

Figure 2-83. Create Route

17. You can attach a public IP address with this menu, and a public IP address can be reserved from IP Pools. Check reserve IP address settings from this menu to create an IP reservation and its update (Figure 2-84).

IP Reservations

You can reserve public IP addresses for instances that require network access to the internet. [Learn more.](#)

Name	Status	Public IP Address	For Instance
a050e64-dbae-42e2-9c59-448f12577abb	Temporary	141.144.32.122	OL_S_4_UER3_u86_64_20161209091125

Figure 2-84. IP reservation

18. Specify a reservation name and instance for creating an IP reservation (Figure 2-85).

Create Public IP Reservation

Enter a reservation name to reference in virtual machine instance configurations. [Learn more.](#)

Name

For Instance

! You are permitted to use resources above your subscription rate at additional cost. [Details](#)

Figure 2-85. Create Public IP Reservation

19. Update reservation IP for status (Figure 2-86).
 - *Name*: Specify a name.
 - *Boot image*: The image to be selected for imaging is entered here.
 - *Size*: Size can be 2000GB.
 - *Status*: Normally, if a temporary address is needed, you can select “Temporary”; otherwise, you can select a permanent IP address.

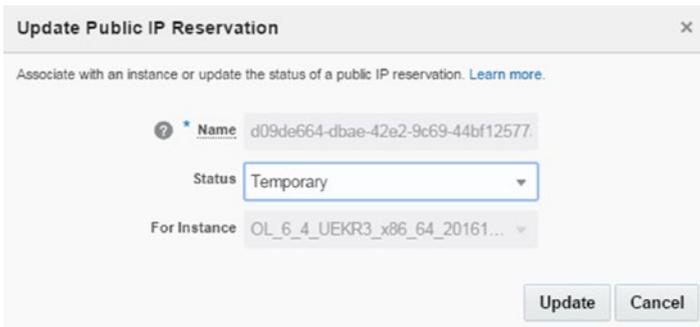


Figure 2-86. Updating IP reservation

20. Check status for SSH public keys (Figure 2-87).

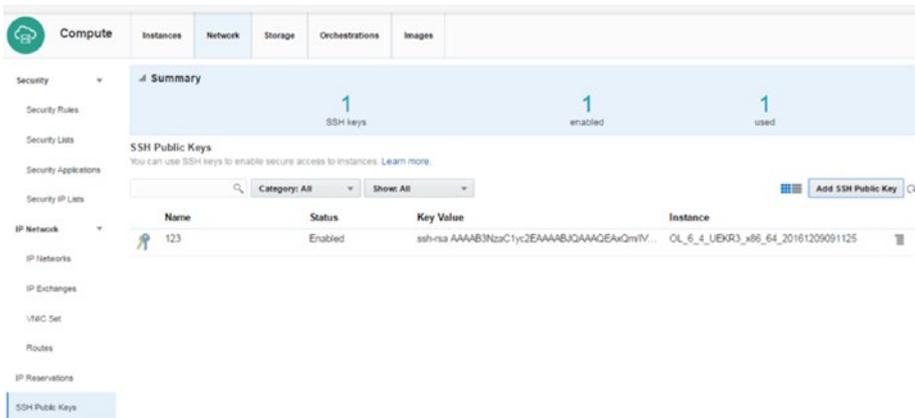


Figure 2-87. SSH public keys

- Specify which SSH public key to add (Figure 2-88).

Add SSH Public Key [X]

Enter an SSH key name to reference this key for launching virtual machine instances. Copy your SSH public key value and paste it here. Paste the key value exactly as it was generated. Don't append or insert any spaces, characters, or line breaks. [Learn more.](#)

? * **Name**

? * **Value**

Select File

Enabled

Add Cancel

Figure 2-88. Adding an SSH public key

- Click View for viewing the SSH public key (Figure 2-89).

View SSH Public key [X]

? * **Name** 123

? * **Value** ssh-rsa
 AAAAB3NzaC1yc2EAAAABJQAAAQEAxQmIVJkSlbgGgQk59UJ21C
 06nN8egnZcAzPCoIW2JccpM9astWhT1zldBVsuAQAJBaR/F8bKgSm
 DCI8vMIxc0l+tmXTzrFzmlDgaV3MeoOgROd1MunktsiRpSPrRye3v7
 vRY4dGGwRum5AIFCFV2bfBQVqmUNJ6uoa5xpo80p45WgfdLi21H4t
 di90SPsh05nPk5NDUX4JzjaTRSN...

Select File

Enabled

Ok

Figure 2-89. Viewing the public key

Storage

1. Many business operations occur within days, and these have many requirements. Some require greater disk space. Oracle Cloud provides fast provisioning in this regard. I'll show you how to increase storage volume in this section. Click the Storage section to check the storage system of the compute node (Figure 2-90).

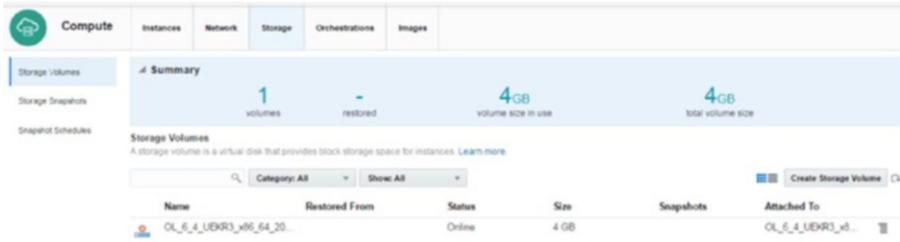


Figure 2-90. Storage volumes

2. Create storage volume and specify size (Figure 2-91).
 - *Name*: Specify a name.
 - *Boot Image*: Select an image for imaging.
 - *Size*: Size can be 2000GB.
 - *Storage Property*: There are differences in storage properties. For example, if low-latency high IOPS are desired, storage/latency may be preferred. Otherwise, storage/default can be selected.
 - *Description*: Comments can be added here.

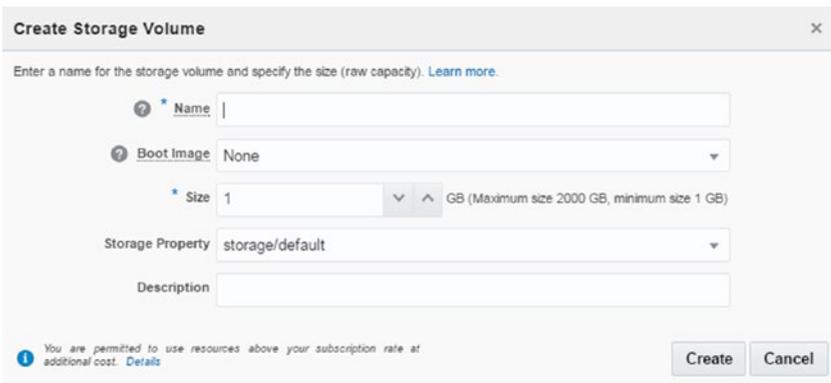


Figure 2-91. Create Storage Volume

3. If necessary, stored data can be backed up on storage volume. In addition, you can take multiple snapshots of storage volume, and all the stored data can be included in the storage volume. Select Create Snapshot from the storage options (Figure 2-92).

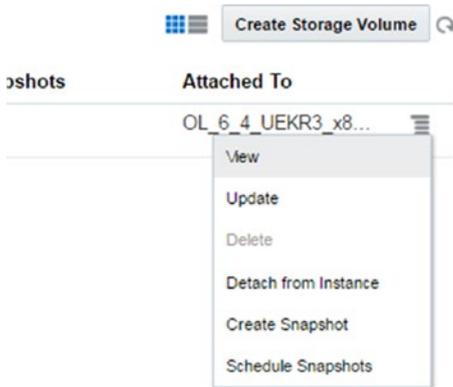


Figure 2-92. Creating storage volumes

4. Enter a name to create a snapshot. To create a snapshot across a site (Figure 2-93), enter the following:
 - *Name*: Specify a name.
 - *Colocated*: All snapshots are stored at the same location, and as each snapshot uses the same size of storage, the required options can be provisioned quickly.
 - *Description*: Comments can be entered here.
 - *Tags*: Tags can be added.

Create Storage Snapshot ×

Enter a name for the storage snapshot. Select Colocated if you want to quickly create a snapshot that will be available only in the current site. If you want the snapshot to be available across sites as a data backup, don't select Colocated. In this case, it will take longer to create the snapshot and to restore volume from it. [Learn more.](#)

Colocated

Figure 2-93. Create Storage Snapshot

5. Specify the snapshot schedule. This section allows you to create a snapshot periodically and set snapshot retention (Figure 2-94).
 - *Name*: Specify a name.
 - *Enable*: Enable options to be selected for start service.
 - *Retention*: Options for backup retention.
 - *Interval*: Select backup interval.
 - *Every*: An interval, such as hourly or weekly, can be selected.
 - *Description*: Comments can be entered here.

Schedule Snapshots ✕

A storage snapshot schedule allows you to specify the periodicity of snapshots creation and the number of snapshots to retain. [Learn more.](#)

* Name

Volume

Enable

* Retention Count ▼ ▲

Interval Weekly Hourly

* Every

* At 🕒 UTC

Description

Figure 2-94. Schedule Snapshots

6. Check your specific storage status with View (Figure 2-95).

Compute

[Instances](#)

[Network](#)

[Storage](#)

[Orchestrations](#)

[Images](#)

Storage Volumes / OL_6_4_UEKR3_x86_64_20161209091125_storage

Information

Name: /Compute-trconsult1/synsrgl@yandex.com/OL_6_4_UEKR3_x86_64_20161209091125_storage

Description:

Property: storage/default

Size: 4 GB

Status: Online

Bootable: true

Attached to instance [Attach to instance](#)

Name	Status	CPUs	Memory	Disk #	Tags
OL_6_4_UEKR3_x86_64_20161...	Running	1	7.5 GB	1	/Compute-trconsult1/synsrgl@yandex.com/OL_6_4_UEKR3_x86_64_2...

Storage Snapshots [Create Storage Snapshot](#)

No snapshot created from this volume.

Backup Configurations [Create Backup Schedule](#)

No backup configuration created for this volume.

Figure 2-95. Storage volumes

- Update storage volume size from this section (Figure 2-96).

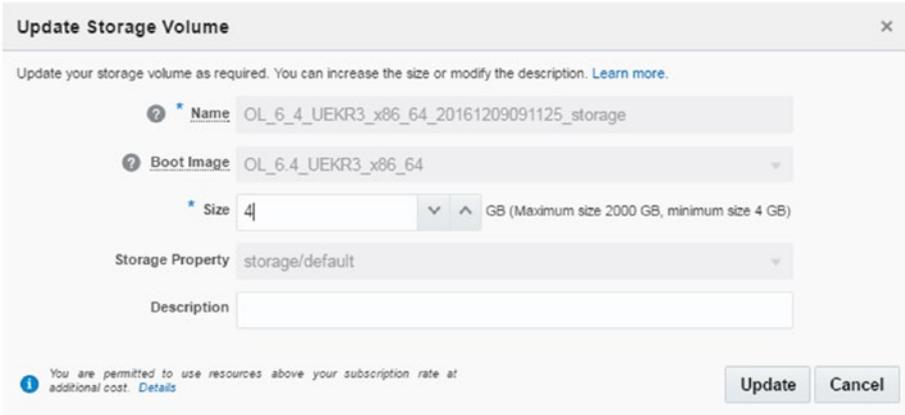


Figure 2-96. Update Storage Volume

Orchestration

New generation IT structures organized with file-based architecture such as puppet and terraform use REST api for creating required orchestration. Oracle Cloud works with orchestration files. This service describes the attributes and interdependencies of gathering network, compute, and storage resources. Following are features of orchestration.

- Enter the Orchestrations section (Figure 2-97).

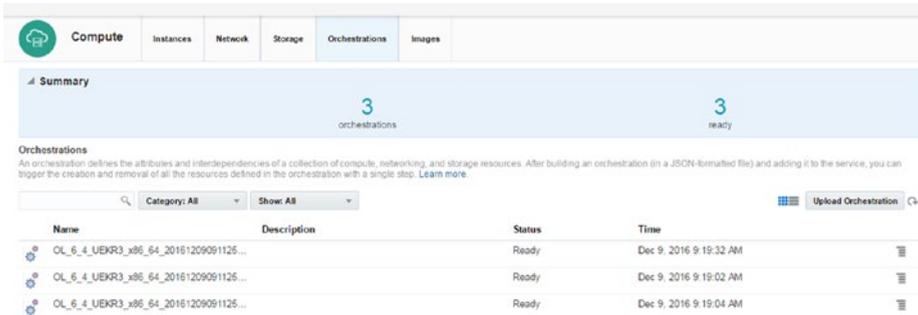


Figure 2-97. Orchestration

- Click View for checking status (Figure 2-98).

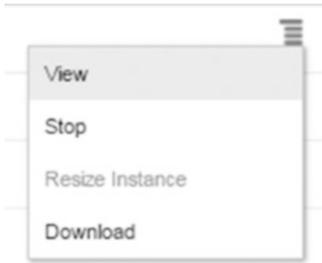


Figure 2-98. Orchestration options

3. Check orchestrations status, thereby allowing this service to work with JSON (Figure 2-99).

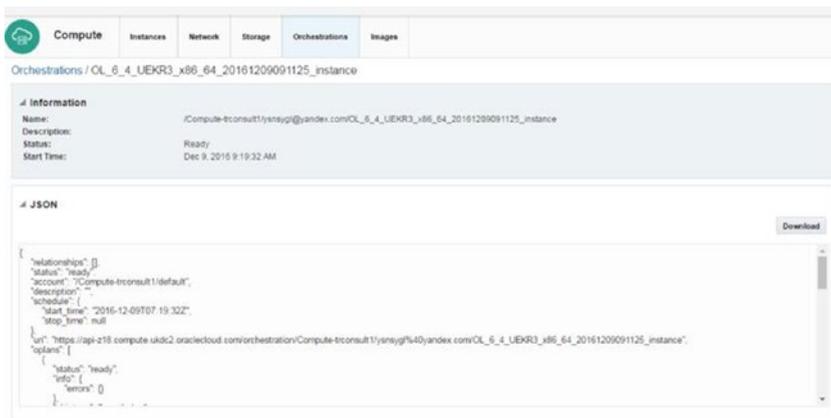


Figure 2-99. Orchestration details

4. Upload a specific orchestration file for prepared services. The orchestration file provides control provisioning and resources, so that the orchestration file can be created manually. However, it must create a JSON format (Figure 2-100).

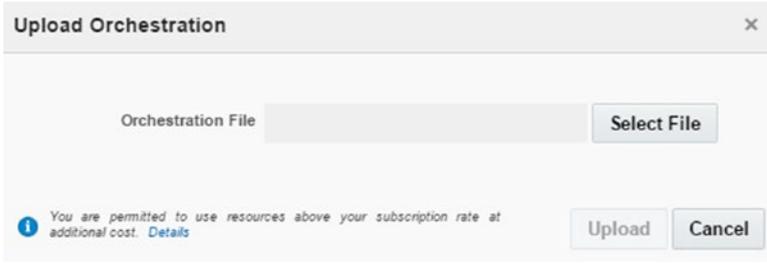


Figure 2-100. Upload Orchestration

5. Click Image for uploading a specific image or creating new associate images (Figure 2-101).



Figure 2-101. New associate image

Bring Your Own Image

It is important to be able to add images in Oracle Cloud, because it is likely the customer’s primary goal to use his or her own images. There are, of course, criteria governing this procedure. The following are the OS versions currently certified in this regard:

- 6.4, 6.6 UEK3 and UEK4
- 6.7 UEK4 and UEK4
- 6.8 ,7.1, 7.2 UEK3
- Solaris 13

Note Oracle Linux’s 2.6.36 kernel version must be used for booting the system.

1. Some network configurations must be set in an interface configuration file (`/etc/sysconfig/network-script` and `ifcfg-interface`); otherwise, your virtual machine (VM) may not work properly in the cloud.

Device: The created interface

ONBOOT: This configuration must be `yes`, because the system is looking for a bootable machine.

TYPE: This configuration must be Ethernet.

BOOTPROTO: This configuration must be DHCP.

PERSISTENT_DHCLIENT: This configuration must be `1`.

2. `opc-init` can be installed, and you should create an OPC user. Modify `/etc/sudoers` by using the `visudo` command and `%opc ALL=(ALL) NOPASSWD: ALL`.
3. First, shut down your VM to convert the image.
4. VDI must be converted with the following command:

```
VBoxManage internalcommands /your_path/VM.vdi /yourpath/image_file.img
```

5. The image can be shared with the following command, owing to size:

```
cp --sparse=always /your_path/image_file.img /your_path/image_sparse.img
```

6. Create a tarball for this file with the `-s` option.
7. Click the Images tab (Figure 2-102).

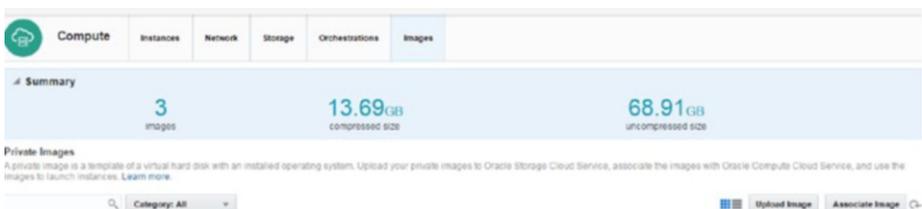


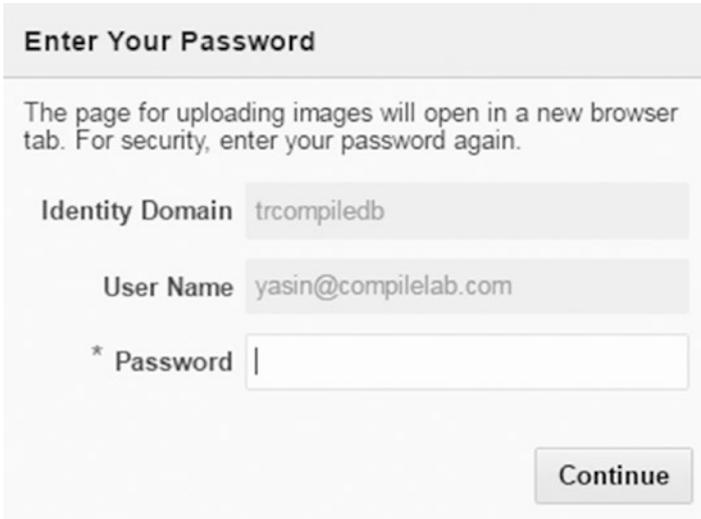
Figure 2-102. Private Images

8. Click Upload Image (Figure 2-103).



Figure 2-103. Upload Image

9. Enter your credentials (Figure 2-104).



Enter Your Password

The page for uploading images will open in a new browser tab. For security, enter your password again.

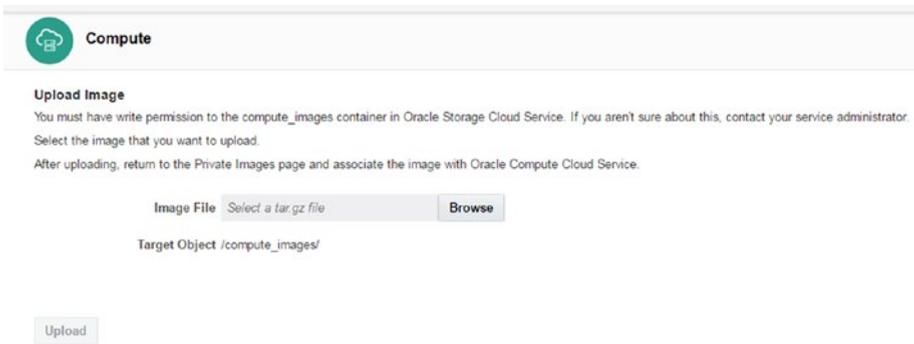
Identity Domain

User Name

* Password

Figure 2-104. Password

10. Now upload your image through Image File (Figure 2-105).



Compute

Upload Image

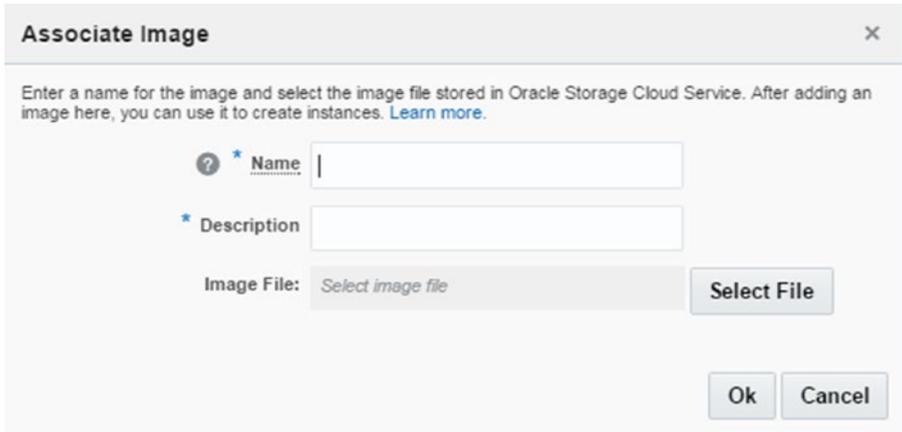
You must have write permission to the compute_images container in Oracle Storage Cloud Service. If you aren't sure about this, contact your service administrator. Select the image that you want to upload. After uploading, return to the Private Images page and associate the image with Oracle Compute Cloud Service.

Image File

Target Object

Figure 2-105. Upload Image

11. After Upload Image, Associate Image uploads your image (Figure 2-106).



Associate Image [X]

Enter a name for the image and select the image file stored in Oracle Storage Cloud Service. After adding an image here, you can use it to create instances. [Learn more](#).

? * **Name**

* **Description**

Image File:

Figure 2-106. Associate Image

User Account Administration

Although many cloud services are presented as ready-to-use, several security problems could arise if your user administration—basically, high-level access to your environment—is insecure. Remember that 80% of all security breaches come from inside an organization. Therefore, spend time on mapping which user should get what (maximum) access to your cloud services.

1. Open the cloud dashboard (Figure 2-107).

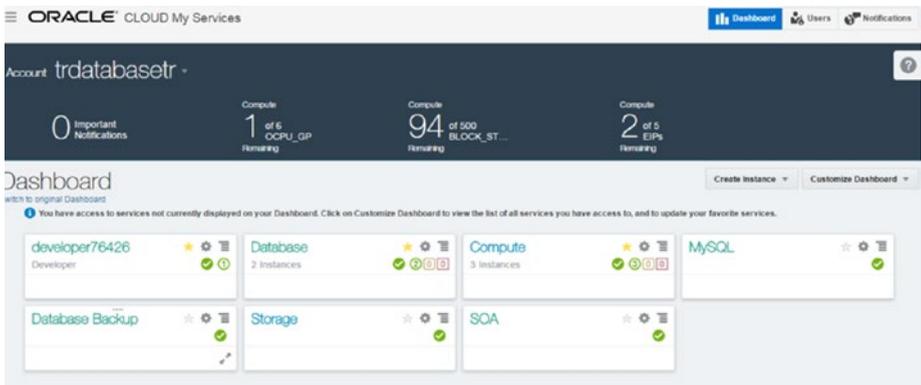


Figure 2-107. Cloud dashboard

2. Click the Users button at the top-right of your screen (Figure 2-108).

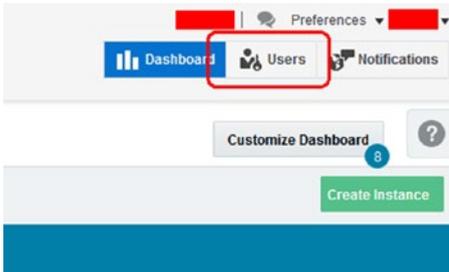


Figure 2-108. Users button

3. Click the Users section to add a new user (Figure 2-109).

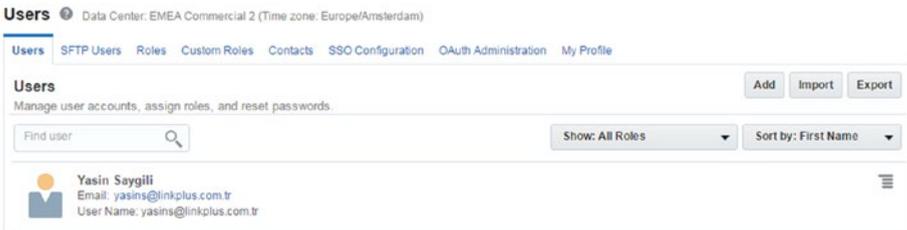


Figure 2-109. Users

4. A new user can be added with the Add User button. Enter the new user information, such as first name, last name, and e-mail. By default, the username will be the e-mail address. You can choose not to do this, if you prefer (Figure 2-110).

Add User

* First Name

* Last Name

* Email

Use email as user name

Manager Email

Roles

Select the roles you would like to assign to the user. You can either use the simple role selection or the advanced selection. Remember to click > or >> icon to complete selection of your roles.

Simple Role Selection

Identity Domain Administrator

Service >>

Selected Roles

Advanced Role Selection

Figure 2-110. Add User

In the bottom half of the screen, you can decide which access rights each user will have. Please note that the Identity Domain Administrator privilege means that this user can change access settings for every user.

5. The SFTP Users section allows you to set a password for the user account (Figure 2-111).

Users Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)

Users **SFTP Users** Roles Custom Roles Contacts SSO Configuration OAuth Administration My Profile

SFTP Users

Set password for Secure FTP user accounts to perform FTP operations related to the cloud service.

Find user

	em255255 em255255 Email: em255255@c9s@oracle.com User Name: em255255	<input type="text"/>
	em287777 em287777 Email: em287777@c9s@oracle.com User Name: em287777	<input type="text"/>

Figure 2-111. SFTP Users

Note that the functionality of SFTP users is different in each service type. Logging in using this SFTP username and password will not log you in to the compute instance.

- 6. The Reset Password section allows you to change a user’s password (Figure 2-112).

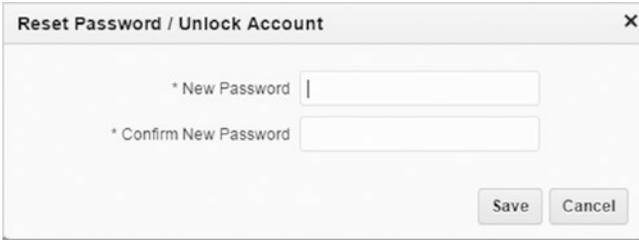


Figure 2-112. Reset Password

- 7. To make administration easier, you can predefine so-called roles and grant privileges to those roles. Such roles can then be granted to individual users. There are several predefined roles available (Figure 2-113).

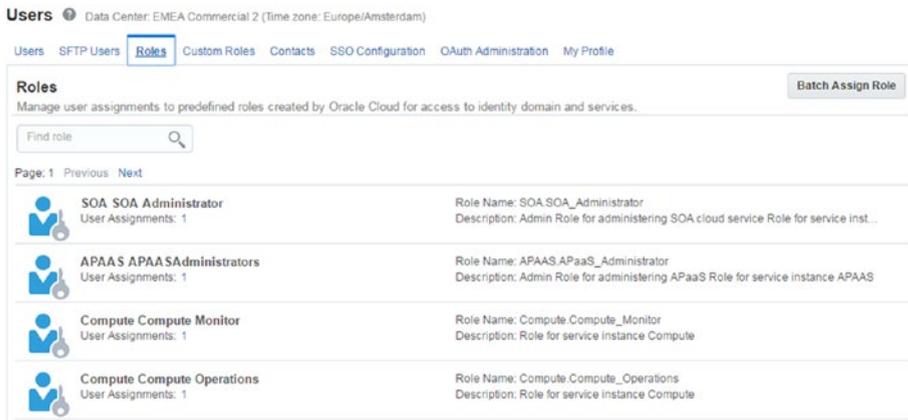
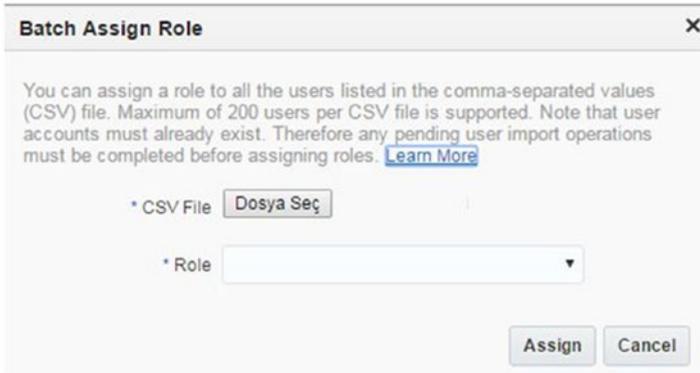


Figure 2-113. Role

- 8. The administrator can batch-assign roles to users. The list should be in comma-separated values (Figure 2-114).



Batch Assign Role [X]

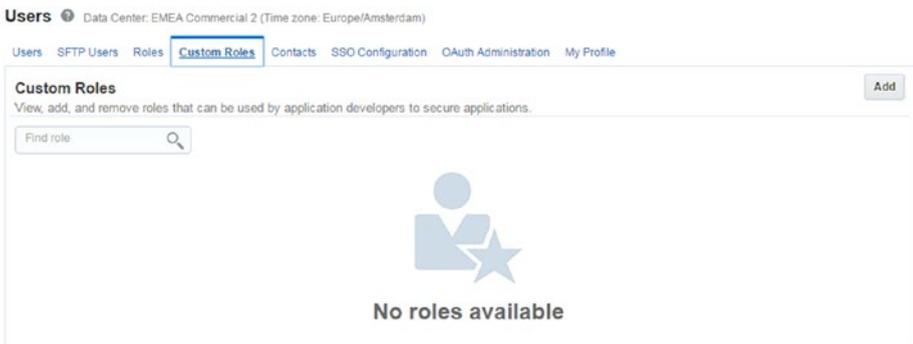
You can assign a role to all the users listed in the comma-separated values (CSV) file. Maximum of 200 users per CSV file is supported. Note that user accounts must already exist. Therefore any pending user import operations must be completed before assigning roles. [Learn More](#)

* CSV File |

* Role

Figure 2-114. Assigning a role

9. Custom Roles allows you to view, add, and remove custom roles that assign non-default privileges to roles (Figure 2-115).



Users Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)

Users SFTP Users Roles **Custom Roles** Contacts SSO Configuration OAuth Administration My Profile

Custom Roles

View, add, and remove roles that can be used by application developers to secure applications.

Find role



No roles available

Figure 2-115. Custom Role

10. To add a custom role, add a new role name in the appropriate box (Figure 2-116).



Add Custom Role [X]

* Role Name

Display Name

Description

Figure 2-116. Add Custom Role

In the Contacts section, you can specify contact information related to contacts that should receive notifications on maintenance, outages, and security incidents but are not listed as users (Figure 2-117).

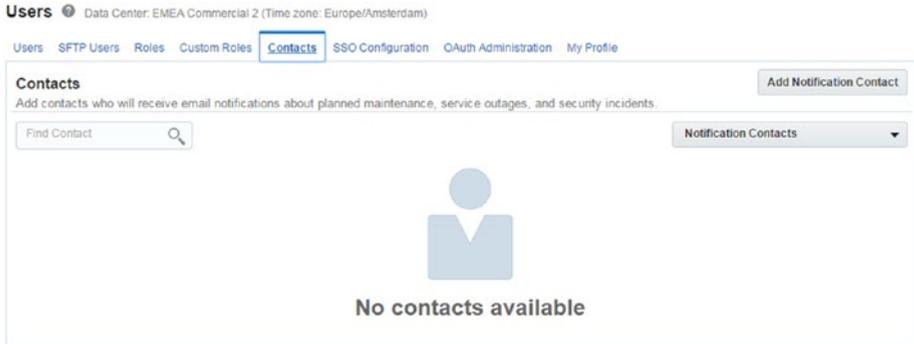


Figure 2-117. *Contacts*

11. After clicking Add Notification Contact, the following screen will be displayed, from which you can specify the contact information and services this contact should use (Figure 2-118).

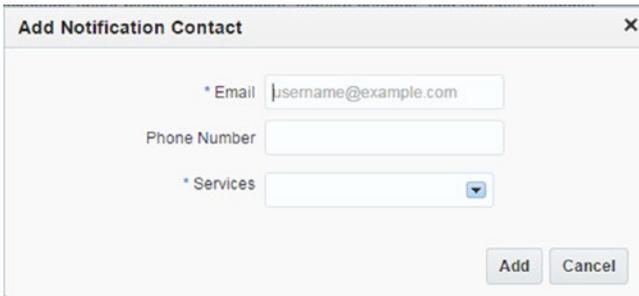


Figure 2-118. *Add Notification Contact*

12. The SSO Configuration tab is used for configuring SSO (single sign-on). Users can use their own company’s SSO credentials for logging in to the cloud dashboard (Figure 2-119).

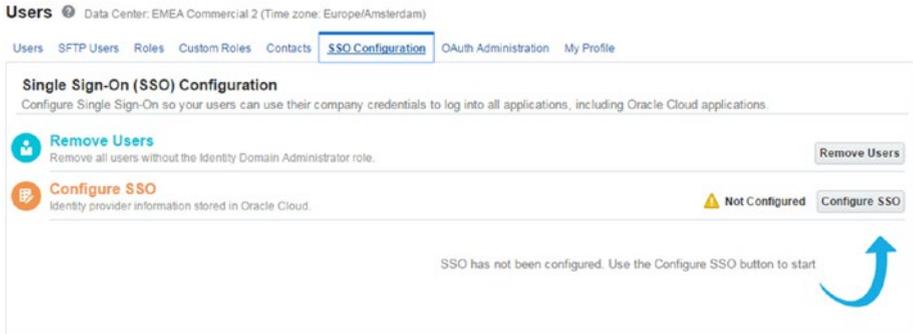


Figure 2-119. SSO configuration

13. In the SSO tabs, you can use the Import identity metadata option or select a manual option to configure SSO (Figure 2-120).

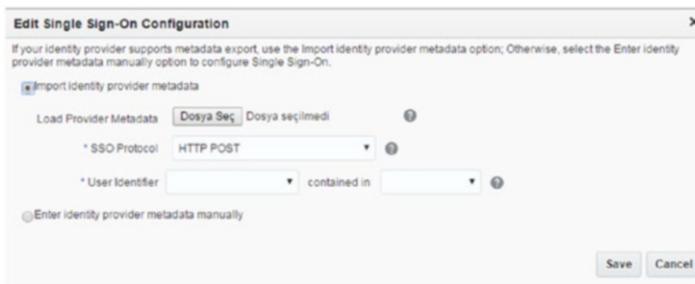


Figure 2-120. SSO configuration

Please check the Oracle manual regarding the exact steps that must be executed, to enable the cloud authentication system to a third-party SSO.

14. SSO tabs provide an interface to manage client access for using the OAuth 2.0 protocol (Figure 2-121).

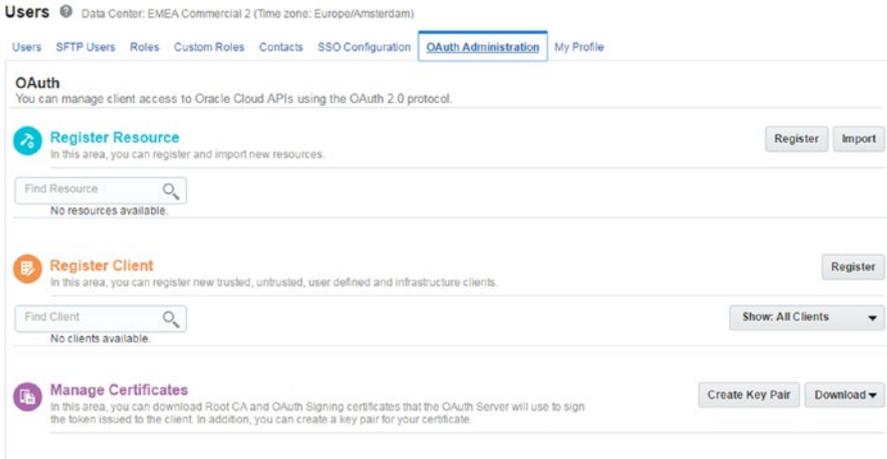


Figure 2-121. OAuth administration

- 15. The My Profile tab shows information related to the user currently logged in. The user can change his/her password and security questions (needed for password recovery). (See Figure 2-122.)

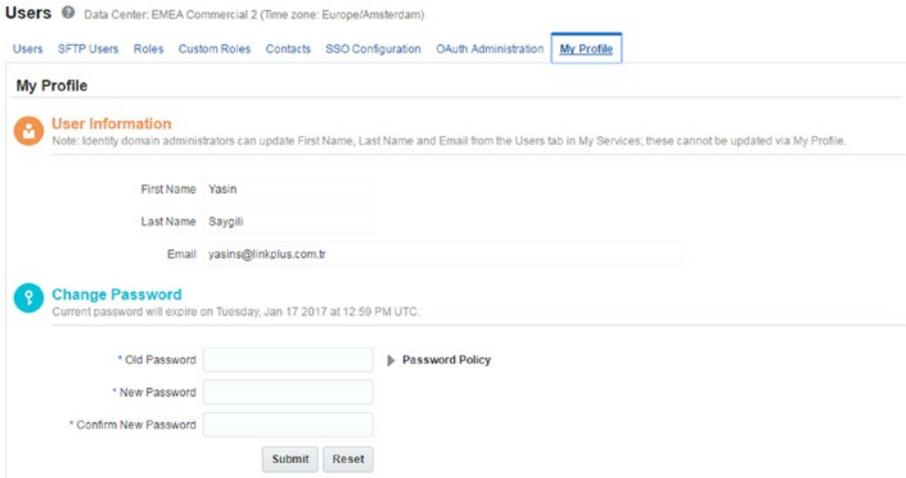


Figure 2-122. My Profile

16. Other user-specific preferences (for the user currently logged in) can be found in the Preferences link at the right-top of the page. The Preferences section provides the option to change language, time zone, and notification settings, based on the user's requirements (Figure 2-123).

Preferences

General

* Language English Advanced...

Timezone

Show What's New

Notifications

Default Notifications Email and Notifications Tab Advanced...

Country Calling Code United States (+1)

Mobile Number +1

Cancel OK

Figure 2-123. Preferences

17. Notifications

All notifications that have been sent to users are listed and can be viewed by clicking the Notifications button, visible at the top-right of the screen (next to the Users button). All provides complete information upon notification, such as Applications, Platform Services, and Notification Preferences (Figure 2-124).

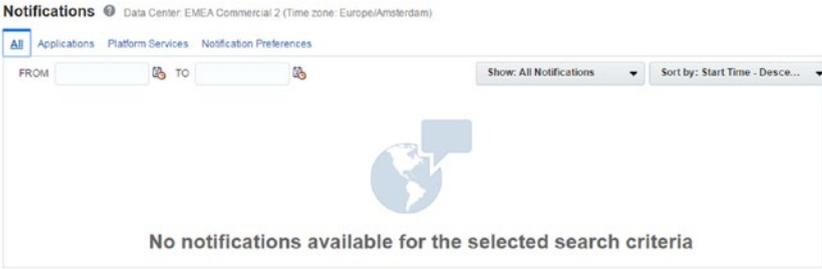


Figure 2-124. Notifications

18. The Applications section provides only application information at notification (Figure 2-125).



Figure 2-125. Application on notification

19. The Platform Services section provides only platform service information at notification (Figure 2-126).

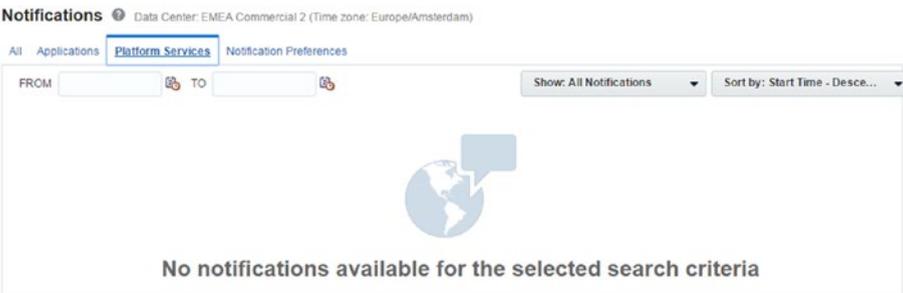


Figure 2-126. Platform services are provided on notification

20. The Notification Preferences tab is used for notification preferences. Here, you can determine which notifications should be e-mailed (or SMS-ed) and which should be displayed only in the Notifications tab (Figure 2-127).

Notifications ⓘ Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)

All Applications Platform Services **Notification Preferences**

General Reset Save

Specify where you want to receive notifications, or whether you want to see them in the Notifications tab only.

Default Notifications: Email and Notifications Tab ▼

Country Calling Code: United States (+1) ▼

Mobile Number: *1

Notifications will be sent as text messages to your mobile phone. Standard text messaging rates apply.

Categories
Click the checkbox to change the notification preference for a particular category. Unchecked categories will be set to "Default Notification".

<input type="checkbox"/> Planned Outage	Email and Notifications Tab ▼	<input type="checkbox"/> Security	Email and Notifications Tab ▼
<input type="checkbox"/> Unplanned Outage	Email and Notifications Tab ▼	<input type="checkbox"/> Product	Email and Notifications Tab ▼
<input type="checkbox"/> New Release	Email and Notifications Tab ▼	<input type="checkbox"/> Partner	Email and Notifications Tab ▼
<input type="checkbox"/> Marketing	Email and Notifications Tab ▼	<input type="checkbox"/> General	Email and Notifications Tab ▼

Figure 2-127. Notification preferences

Summary

In this chapter, you have learned how to create a compute service and select an application on it from Oracle Cloud Market Place. Oracle's Compute Cloud service could be defined as the main service in the Oracle IaaS architecture. Therefore, if you want to understand Oracle IaaS, you must first understand Oracle Compute service fundamentals. In the next chapter, we are going to examine Oracle cloud storage technology and see how to create and use this service.

CHAPTER 3



Storage Cloud

Today, an inevitable fact is that the IT market is moving from on-premise to cloud systems. In addition, the leading product related to this development is storage in the cloud, owing to the fact that disk usage and types are increasing rapidly in the current market. Within ten years, tapes will have to be changed and maintained periodically, and this could greatly increase the workload of IT professionals. Therefore, cloud storage has been developed to resolve many issues, such as disk replacement, network and CPU usage, and other maintenance concerns. Cloud solutions aim to reduce costs, so cloud storage is offered at an affordable price. In my opinion, cloud storage usage represents approximately 10%–20% of enterprise platforms, but in a few years, it will be roughly 30%–40% of the IT market. If this occurs, the effectiveness of on-premise solutions will diminish day by day. Fortunately, cloud storage solutions are offered by several vendors, such as Oracle, Microsoft, and Amazon.

Oracle Storage Cloud offers solutions for all companies that are in the need of quick provisioned storage, and it includes many great features. Many of these features were adopted for new-generation storage cloud solutions. These technologies are based on cloud, and Oracle Storage Cloud is aimed to solve enterprise problems, such as protection and data sharing, and offer a quick response to increasing data size. Moreover, Oracle Storage Cloud offers new-generation design and a modern user interface, from which cloud operations can be easily configured by IT professionals. This service provides an opportunity to migrate all files from on-premise to the Oracle Storage Cloud systems, which support numerous third-party tools (Figure 3-1).

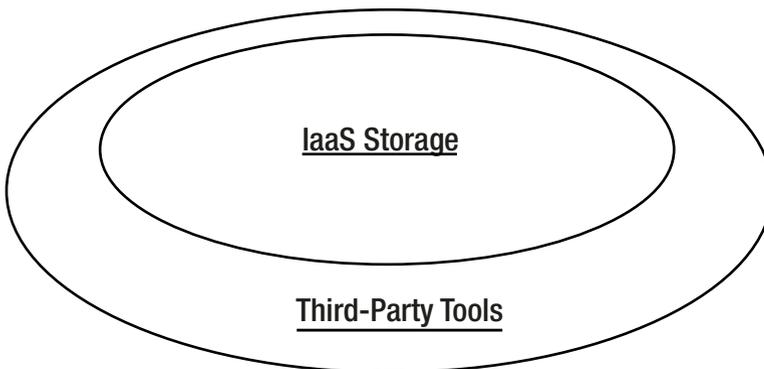


Figure 3-1. IaaS storage and third-party tools relations

At present, customers' main concern is all about security, and they are facing difficulties in trusting real-world reliable cloud systems, owing to security issues. The main point should not be how to back up all your data but how to keep data safe and secure. Therefore, Oracle has a different perspective on cloud security. For example, whenever an object is created in Oracle Cloud, a unique symmetric key is generated by Oracle Cloud (instance whenever).

Standards have changed, and now these standards are being adapted for enterprise companies in terms of RESTful APIs and OpenStack. RESTful APIs will be obligatory for managing cloud and on-premise systems. In my opinion, in the near future, many clients will move solutions to REST technology, and these solutions will be managed by remote third-party tools that are used in IT industries (such as CloudBerry and Commvault).

Advantages of Cloud Storage

The main advantage of the Oracle Cloud Service is price. Oracle offers several price options for using its services with respect to usage type. Hence, no additional costs are accrued. Following are some of the service's other advantages:

1. *Elasticity*: Provides an elastic approach to storing hardware and configuring disk size. With this feature, your data can increase from megabyte to petabyte.
2. *Standardization*: Manages data via third-party tools, such as Open Stack. Manages object files via REST or other tools.
3. *Security*: IaaS encryption provides multiple security layers.
4. *Reliability*: Ensures a high availability of data redundancy through a replication policy. (Data is written to a specific data center, and this data is replicated asynchronously to a selected data center.)

Oracle Storage Cloud is helping to manage services with a few clicks. Next, you will see how the configuration operations are performed.

Installation

Oracle Storage Cloud can be completed in a few steps. First, click the service screen to set storage cloud configurations through PuTTY. There are some prerequisites for installing storage cloud service. Before service installation, the user must take a key for using this service and then connect to it via CloudBerry for ease of management.

1. Find the Storage section from the dashboard (Figure 3-2).

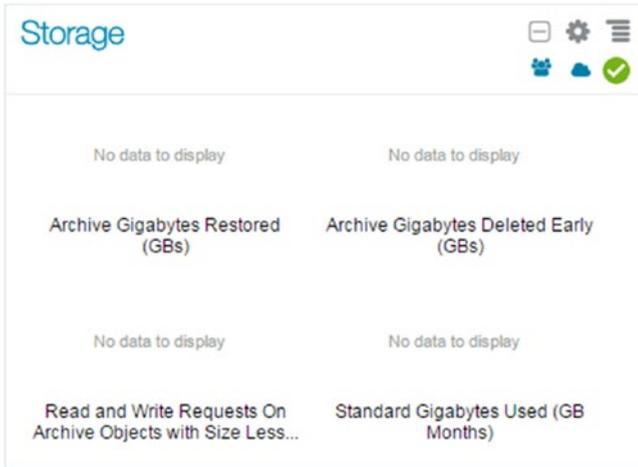


Figure 3-2. Storage service

2. Check your service status and detailed information from the Service Details screen. (This screen shows service usage metrics; Figure 3-3.)

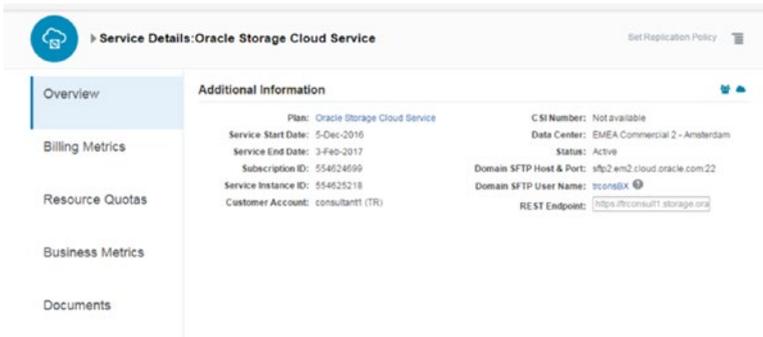


Figure 3-3. Service Details screen

3. Metrics can be controlled through graphs, and these graphs can be correlated to specify days (Figure 3-4).

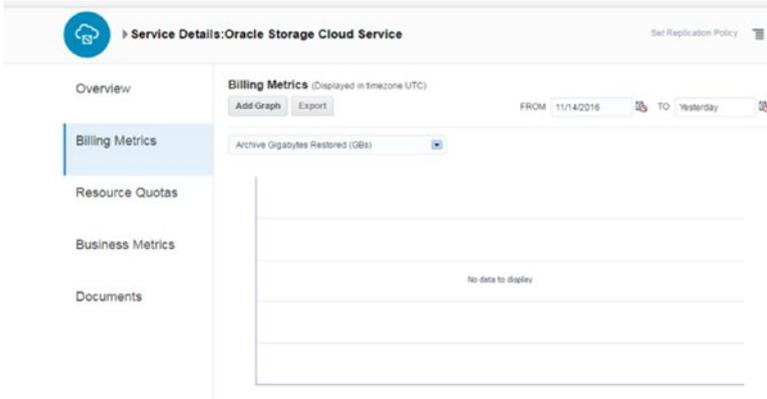


Figure 3-4. Billing Metrics service

4. Quotas can be specified for using cloud services (Figure 3-5).

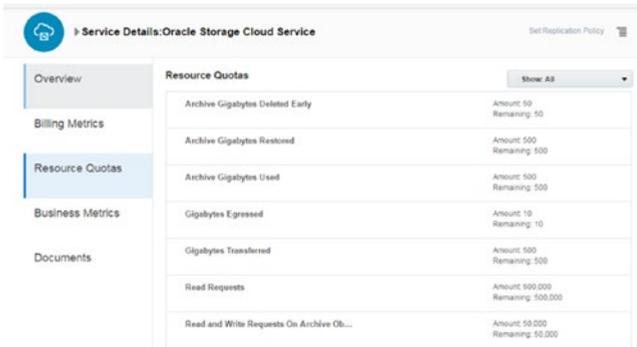


Figure 3-5. Resource Quotas

5. Next, download cURL from the following web site: <https://winapplugins.co.uk/curl/>, to obtain an authentication token for Oracle Storage Cloud Service. (cURL can be considered a REST endpoint, and a container can be created through it. Today, containers also can be created through a service UI.)

Note Be sure to use the cURL directory to execute cURL commands, such as the following.

```
curl -v -s -X GET -H "X-Storage-User: Storage-usthetalen:yasin@ ****.com"
-H "X-Storage-Pass: *****" https://storage.us2.oraclecloud.com/auth/v1.0
AUTH_tkb24e42debe0154c71d19f69586f25967
```

6. Now, a container is being created.

```
D:\curl_7_51_0_openssl_nhttp2_x64>curl -v -s -X PUT -H "X-Auth-Token:
AUTH_tkb2
4e42debe0154c71d19f69586f25967"
https://storage.us2.oraclecloud.com/v1/Storage-u
sthetalen/test
```

```
curl -v -s -X PUT -H "X-Auth-Token: AUTH_tkb24e42debe0154c71d19f69586f25967"
https://storage.us2.oraclecloud.com/v1/Storage-usthetalen/test
```

```
* Trying 129.152.172.4...
* TCP_NODELAY set
* Connected to storage.us2.oraclecloud.com (129.152.172.4) port 443 (#0)
* ALPN, offering h2
* ALPN, offering http/1.1
.....
> User-Agent: curl/7.51.0
> Accept: */*
> X-Auth-Token: AUTH_tkb24e42debe0154c71d19f69586f25967
>
< HTTP/1.1 201 Created
< X-Trans-Id: txde23c6110fb442cb9ec70-0058296fb9ga
< Date: Mon, 14 Nov 2016 08:03:05 GMT
< Connection: keep-alive
< X-Last-Modified-Timestamp: 1479110585.21201
< Content-Type: text/html;charset=UTF-8
< Content-Length: 0
< Server: Oracle-Storage-Cloud-Service
<
* Curl_http_done: called premature == 0
* Connection #0 to host storage.us2.oraclecloud.com left intact
```

Replication place issues may follow, and you may receive an error as a result of the next step.

```
<html><body>The operation was not performed because the replication policy
has not been set. Sign in to My Services as the service administrator and
select a replication policy for your service instance.</body></html>*
Curl_http_done: called premature == 0
* Connection #0 to host storage.us2.oraclecloud.com left intact
```

In order to solve this problem, select “Set Replication Policy” on the Oracle Public Cloud Service console.

1. Look at the service console screen to find Set Replication Policy (Figure 3-6).

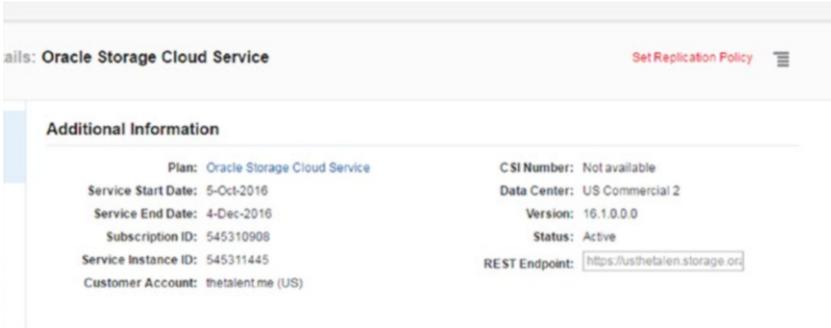


Figure 3-6. Additional Information

2. Select the data center in which you want to locate your storage services (Figure 3-7). (Data is written to a specific data center, and this data is replicated asynchronously to a selected data center.)

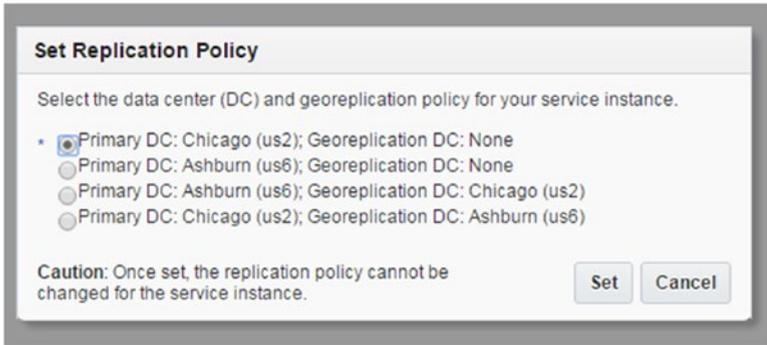


Figure 3-7. Setting replication policy

3. Confirm your selection and don't forget that this policy cannot be modified (Figure 3-8).

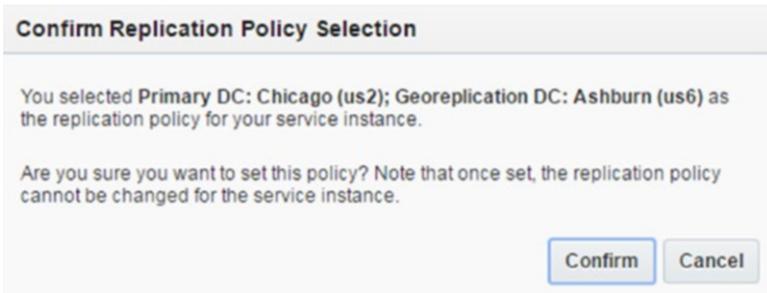


Figure 3-8. Confirming replication policy

4. Verify whether your service is ready. (The authentication key is changed every 30 minutes.)

```
curl -v -s -X GET -H "X-Auth-Token: AUTH_tkb24e42debe0154c71d19f69586f25967"
https://storage.us2.oraclecloud.com/v1/Storage-usthatalen/test
```

```
D:\curl_7_51_0_openssl_nhttp2_x64>curl -v -s -X GET -H "X-Auth-Token:
AUTH_tkb2
4e42debe0154c71d19f69586f25967"
https://storage.us2.oraclecloud.com/v1/Storage-u
sthatalen/test
* Trying 129.152.172.3...
* TCP_NODELAY set
* Connected to storage.us2.oraclecloud.com (129.152.172.3) port 443 (#0)
* ALPN, offering h2
* ALPN, offering http/1.1
* Cipher selection: ALL:!EXPORT:!EXPORT40:!EXPORT56:!aNULL:!LOW:!RC4:@
STRENGTH
* successfully set certificate verify locations:
.....
* SSL certificate verify ok.
> GET /v1/Storage-usthatalen/test HTTP/1.1
> Host: storage.us2.oraclecloud.com
> User-Agent: curl/7.51.0
> Accept: */*
> X-Auth-Token: AUTH_tkb24e42debe0154c71d19f69586f25967
>
< HTTP/1.1 204 No Content
< X-Container-Object-Count: 0
< X-Container-Write: usthatalen.Storage.Storage_ReadWriteGroup
.....
< Connection: keep-alive
< X-Storage-Class: Standard
< X-Container-Meta-Policy-Georeplication: us2-us6
< X-Last-Modified-Timestamp: 1479110585.21201
< Content-Type: text/html;charset=UTF-8
< Server: Oracle-Storage-Cloud-Service
<
* Curl_http_done: called premature == 0
* Connection #0 to host storage.us2.oraclecloud.com left intact
```

■ **Note** The token will expire after a half hour. If you don't change the necessary token, you will receive the following message: "404 not found error."

CloudBerry

CloudBerry is a third-party tool for using and monitoring IaaS products, and it supports many products from such vendors as Oracle, HP, and Rackspace. The most important aspect of CloudBerry is its backup features, which are the primary reason many companies purchase products from CloudBerry.

1. Connect CloudBerry Explorer for OpenStack Storage. This program can be downloaded here: www.cloudberrylab.com/free-openstack-storage-explorer.aspx.
2. Go to File ► New Oracle Cloud Account (Figure 3-9).

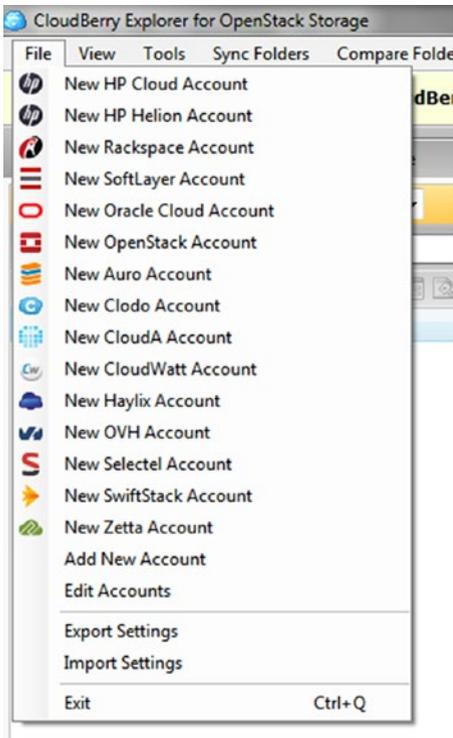


Figure 3-9. Oracle Cloud on CloudBerry

3. Fill the blanks with the necessary information (Figure 3-10).
 - *User name*: Enter your username, such as Storage-[Identity Domain]:[Registered Mail].
Example: Storage-usthethalen:yasin@thetalent.me
 - *Password*: Enter your registered password.
 - *Authentication Service*: If a cloud account is registered from US2, please use the following command:
`https://storage.us2.oraclecloud.com/auth/v1.0`



Figure 3-10. Credentials in CloudBerry

4. Find your container from CloudBerry, which will be ready to accept your data (Figure 3-11).

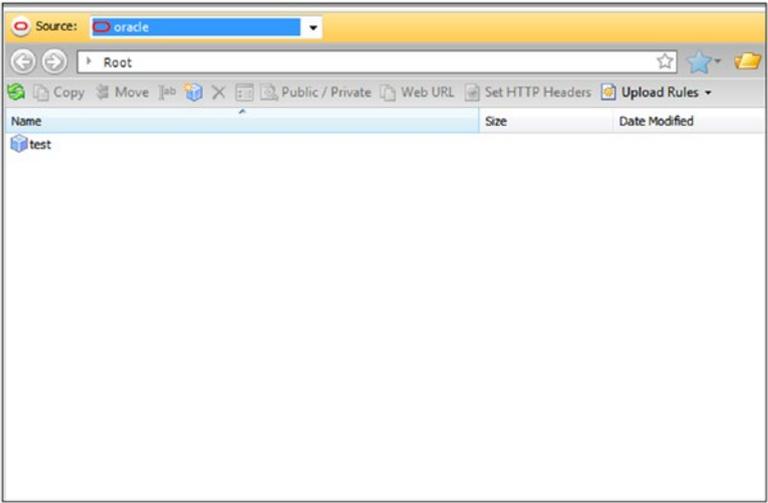


Figure 3-11. Credentials in CloudBerry

5. Move your data from on-premise to the Oracle IaaS cloud, using the drag-and-drop method (Figure 3-12).

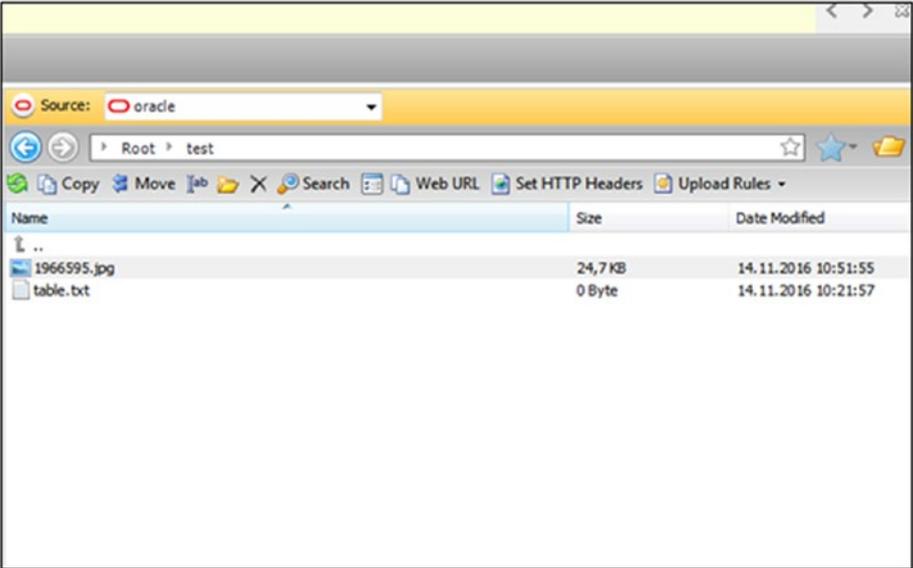


Figure 3-12. CloudBerry

Summary

In this chapter, I discussed how to create and use a storage cloud service. This service provides backup easily, with a few clicks. Many objects can be backed up with the Oracle Storage Cloud Service. In this section, we reviewed how to perform several tasks that can be accomplished by using the storage cloud. In the next chapter, you will see how to make a cloud transformation with Ravello.

CHAPTER 4



Ravello

Today's IT market is growing with the development of new products, and purchases are increasing proportionally. The size of the market exceeds 1 billion dollars for IT vendors of on-premise solutions, excepting cloud solutions. Of course, these purchases will not always be beneficial, as many products can be selected that are not suited to certain IT sectors. A lot of money is wasted as a result of these bad choices, and the main reason for this is incorrectly tested products. Therefore, many projects fail, owing to this reason and also because if very expensive purchases lead to bad results, buyers can be removed from their jobs. Oracle's Ravello service is trying mitigate these problems, putting IT professionals on the right path to purchasing products that yield positive results.

Ravello's acquisition by Oracle was announced on February 22, 2016 and was completed in March 2017. The product transforms any public cloud, currently Amazon AWS, Google Cloud, and Oracle Public Cloud Service, into the ideal enterprise development and test infrastructure.

Ravello is a product development environment (Figure 4-1). With this service, you can easily use different cloud providers, such as Google Cloud and Amazon Cloud.

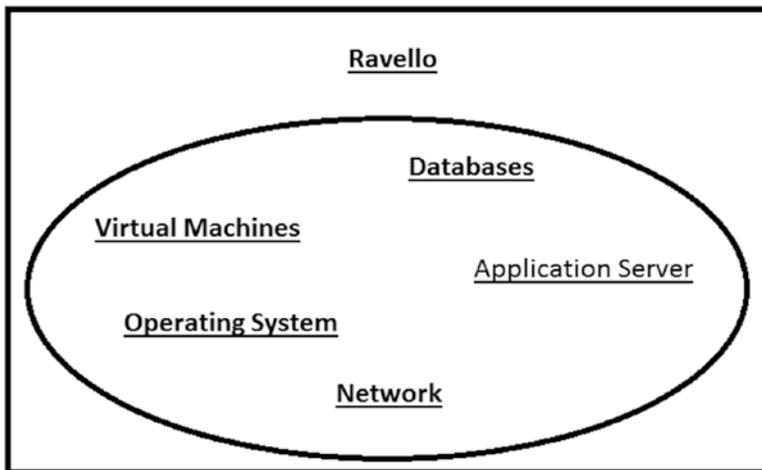


Figure 4-1. Ravello and IT environments

Changing enterprise business needs are driving cloud-based solutions. Developers want their own test environment, and customers want to have an online demo or trial environment—all of this simulated as if it were on-premise. Ravello provides rapid deployment and management of all virtualized enterprise environments into its cloud systems. Oracle Ravello is able to run VMware and KVM environments, without network or driver changes, unaltered on the Ravello systems. In addition, virtualized disks and CD/DVDs can be uploaded to start new environments.

HVX

The hypervisor in a virtualization environment is used to translate requests from the virtual machine (VM), for example, a write request or a network request, into the proper format for the underlying hardware. Because most cloud providers use different virtualization technologies, Ravello built a so-called nested hypervisor layer called HVX.

A VM built for VMware will have different requests for disk access than a VM built on Google Cloud. Ravello's HVX technology "knows" the different kinds of requests the supported source platforms use. Ravello also has drivers for the various cloud platforms it runs on.

So, no matter what your source virtualization technology is, and no matter what your target cloud service is, Ravello will translate all requests from the VM into requests that are accepted by the underlying cloud platform. Currently, Ravello can utilize the following cloud solutions as supported targets:

1. Oracle Public Cloud
2. Amazon Web Service
3. Google Compute Cloud

The customer can decide, based on location of the target cloud provider service, which underlying service is used. Billing is transparent for the user; only Ravello will send him or her an invoice.

Management

Oracle Ravello is a widely available system to simulate all infrastructure services in the cloud. The environments are fully isolated, owing to VXLAN technology, and can be managed by either an impressive GUI or through REST API calls. Ravello allows you to plan the starting and stopping of environments and displays very detailed overviews of costs per application and costs incurred so far.

Network

The Ravello service provides a highly secure network for accessing and managing Oracle Ravello services based on Virtual Extensible LAN (VXLAN) technology. The switches can simulate a Layer 2 network, which includes broadcasting and multicasting. Several network segments will be created automatically, based on the settings in the VM, per network.

A Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) simulate, together with the routers and switches that are needed to connect the various networks.

When duplicating an existing Ravello setup, all networks will remain the same in the copy of the original application. Owing to the VXLAN usage, several networks (for copies of ViMs) can be exactly the same (same IP ranges, IP addresses, gateways, etc.), so that it is very easy to roll out several identical setups for demonstration, testing, training, and development purposes.

Advantages of Ravello

Oracle Ravello had many advantages, but one of the best is that it helps to duplicate an IT environment design with drag-and-drop motions or, for a VMware environment, by simply pointing the upload agent to the running VMware system. The upload agent will duplicate the VMware setup as an exact copy into the Ravello environment. Other advantages of Ravello service are the following:

1. **Agility.** Ravello reduces provisioning time for testing machines. Create it once, and you can provision it multiple times in seconds.
2. **Cost.** Because there is no up-front charge for using this service, fees accrue only when the VMs are actually started, thereby saving you on CAPEX expenses. Owing to the automatic stop and scheduling options, you save on OPEX costs.
3. **Scalability.** Users can increase sizing or run multiple environments from any geographical location.
4. **Fidelity.** Ravello provides exact clones from existing VMs in your data center and runs them unaltered on the Ravello cloud.

Ravello Import Utility

The easiest way to start a new Ravello VM is to upload an existing VM, virtualized disk, or CD/DVD. Ravello currently accepts KVM, OVA, and OVFA files and also their internal Ravello format. Currently, your VMs can be imported through the Ravello import utility, which is available as a native application for Windows or as a command line interface. On Microsoft Windows, this utility can be installed easily with a few clicks. It will install like a desktop application. When put into service, it can work with the desktop application.

Oracle Ravello is helping to test your environment with a few clicks. Here's how the installation is done.

1. Request a trial account from the Oracle Ravello web site (https://cloud.oracle.com/en_US/ravello) (Figure 4-2).

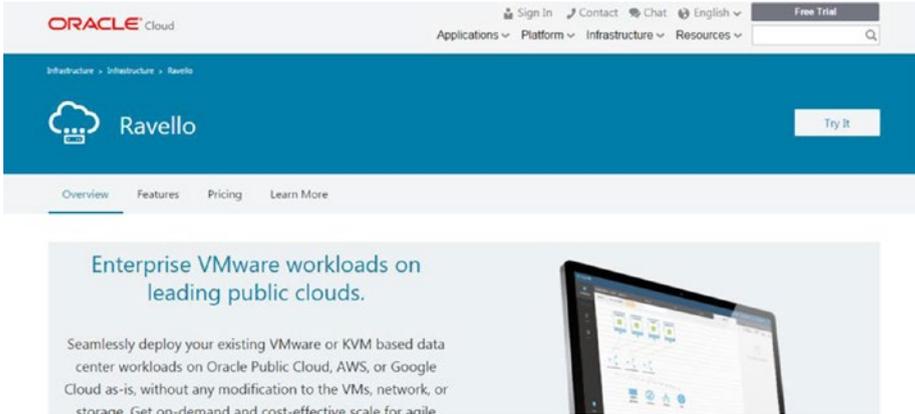


Figure 4-2. Ravello trial

2. Fill in the required information on the registration form (Figure 4-3).

The image shows the Ravello trial registration form. At the top, it says 'ORACLE | ravello'. Below that, it says 'Thanks for trying Ravello.' and 'By clicking submit you are agreeing to Ravello's terms of use:'. There are two numbered terms of use: 1. This free trial will be used by you as a potential customer, to evaluate Ravello's service in good faith for the use case you are listing here. 2. This free trial will not be used as a free VPS, free gaming or free web hosting service - any such usage will be immediately shut down and reported as abuse. The form has several input fields: 'First Name', 'Last Name', 'Company', and 'Use Case'. The 'Use Case' field is a large text area. There is a 'SUBMIT' button at the bottom.

Figure 4-3. Ravello trial form

3. After receiving an activation e-mail from the Oracle Ravello product team, click the Activate Your Account button (Figure 4-4).

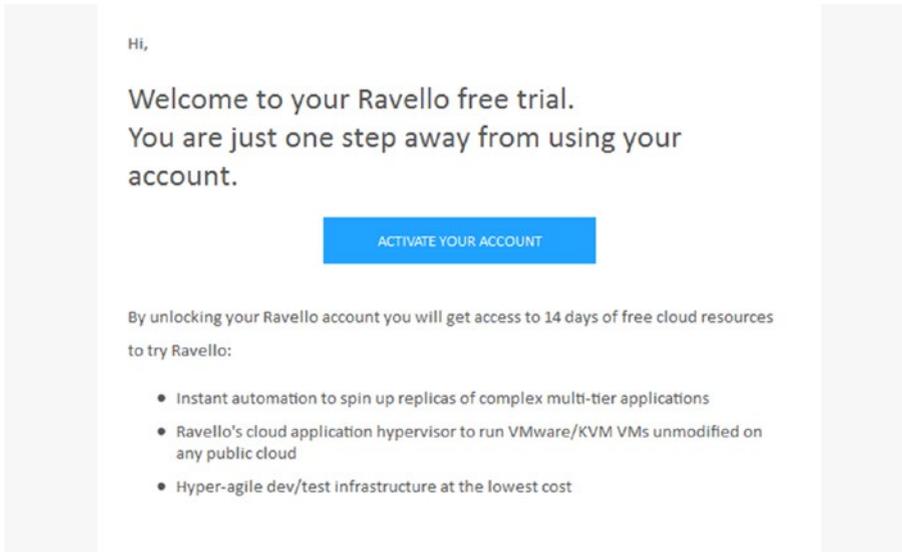


Figure 4-4. Account activation

4. Please specify your password and fill in the other details (Figure 4-5). (By the way, you can request a \$300 trial environment.)

Figure 4-5. Registration

5. Enter credentials for logging in to Ravello (Figure 4-6).

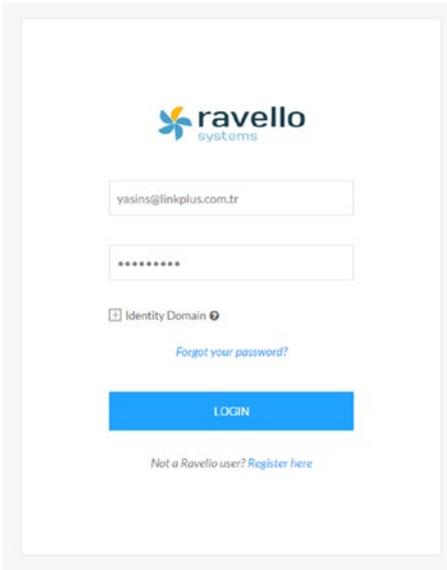


Figure 4-6. Login

6. An introductory video is provided when you get started on Oracle Ravello (Figure 4-7).

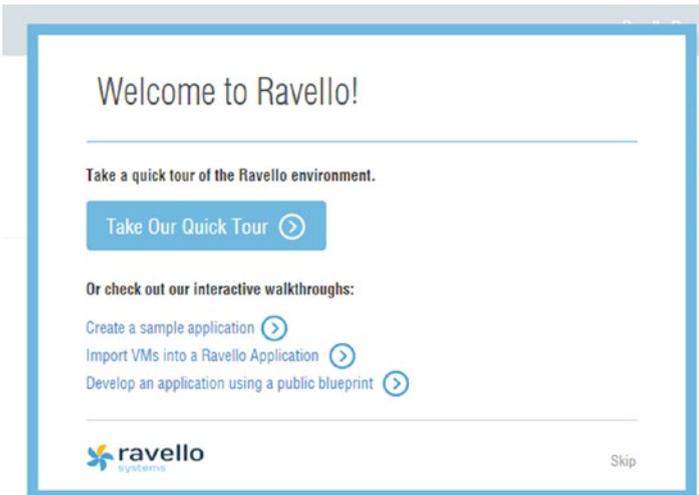


Figure 4-7. Introduction to Ravello

7. On the dashboard page, new applications can be created with the Create Application button. (Ravello classifies applications through Create Application; therefore, users easily understand which new application is selected.) (See Figure 4-8.)



Figure 4-8. Create Application button

8. First, before the import process, an application from the Create Application button must be completed (Figure 4-9).

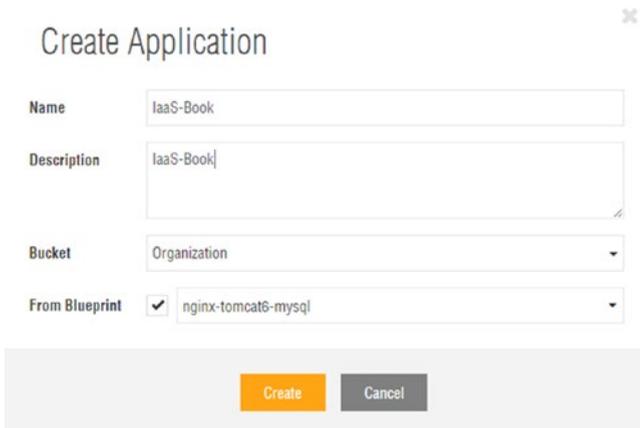


Figure 4-9. Create Application

9. Now, VM can be uploaded using the Import button. (The time may vary, depending on the size of the VM and the distance from the data center.)
10. First, download `installation.exe` and double-click to install the tool.

Select Library from left menu and click VM, then click Import VM and select OS for the downloading import agent. Save the file in a local download location. After the download has finished, start the `.exe` file. Because the setup file will install an application, local administrator rights might be required.

11. Click Next (Figure 4-10).



Figure 4-10. *Importing the virtual machine*

12. Click Install (Figure 4-11).

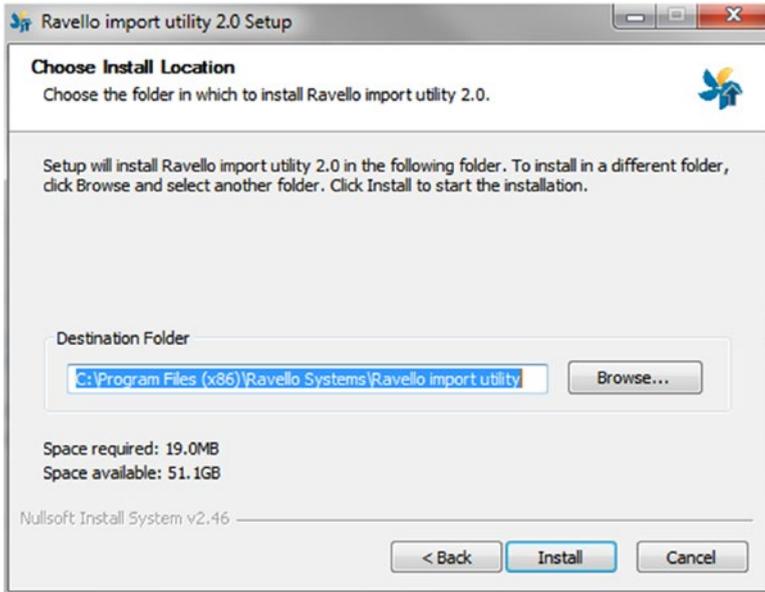


Figure 4-11. Installing a location

13. Wait for the installation (Figure 4-12).

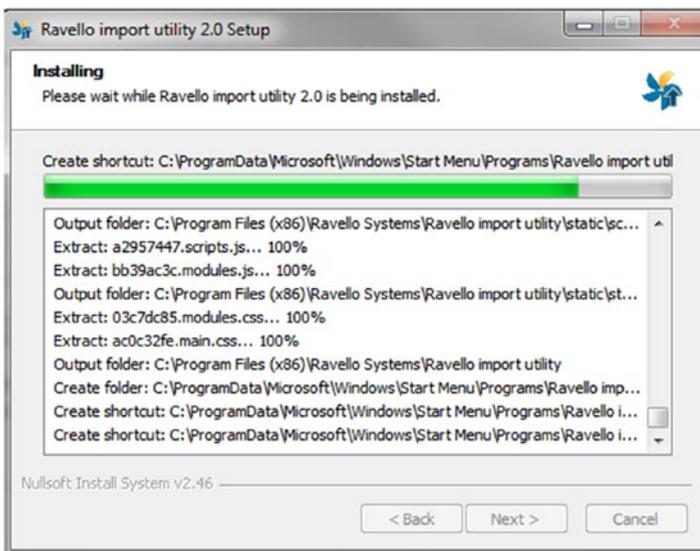


Figure 4-12. Loading bar

- 14. Finally, finish the installation (Figure 4-13).

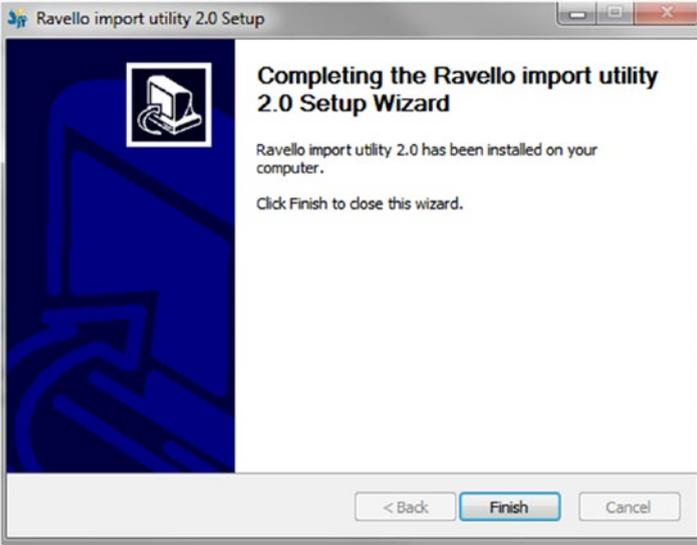


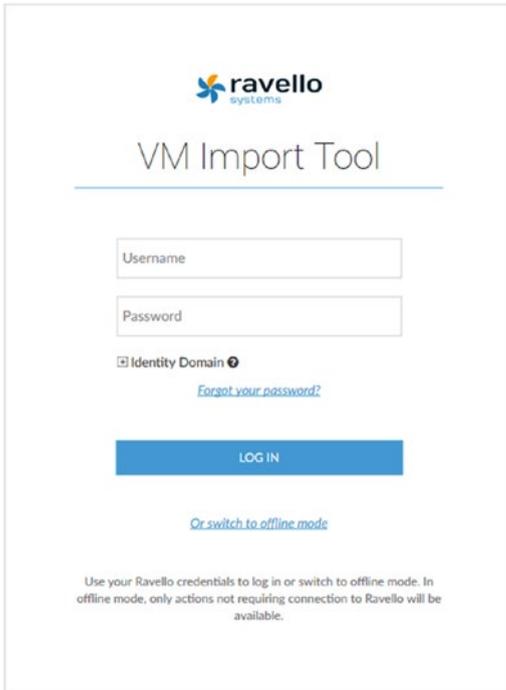
Figure 4-13. *Completing the installation*

- 15. Wait for the next screen (Figure 4-14).



Figure 4-14. *Screen*

16. Fill in your credential information (Figure 4-15).



ravello
systems

VM Import Tool

Identity Domain 

[Forgot your password?](#)

LOG IN

[Or switch to offline mode](#)

Use your Ravello credentials to log in or switch to offline mode. In offline mode, only actions not requiring connection to Ravello will be available.

Figure 4-15. Login

17. You will be shown when the dashboard is available (Figure 4-16).



[+ Upload New Item](#)

Figure 4-16. Upload

- 18. Click the Upload button (Figure 4-17) or click “+ Upload New Item (Figure 4-16).



Figure 4-17. Upload button

- 19. After clicking the upload button, a wizard will start. From here, you can choose what you want to upload. Oracle Ravello supports many VM and VM disk types, such as OVA, VMDK, and ISO (Figure 4-18).



Figure 4-18. Upload page

- 20. After selecting the type of file you want to upload, click Start to begin uploading (Figure 4-19).



Figure 4-19. Start button

- 21. Select your VMs (or disks) from your computer and click the Upload button (Figure 4-20).

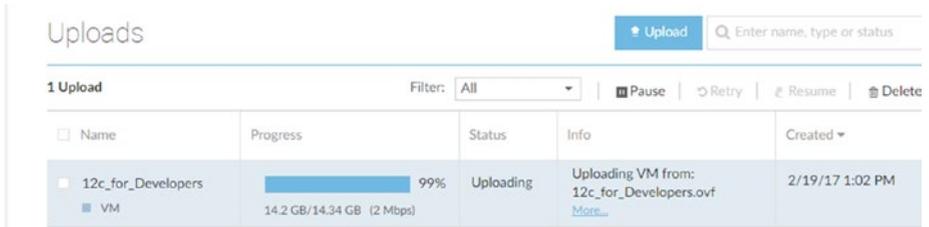


Figure 4-20. *Uploading VM*

22. After VM import, your objects will be stored in your library. When selecting your newly created application, you can drag and drop your recently uploaded VMs into the canvas or connect your recently uploaded disks or ISO files to your VMs (Figure 4-21).

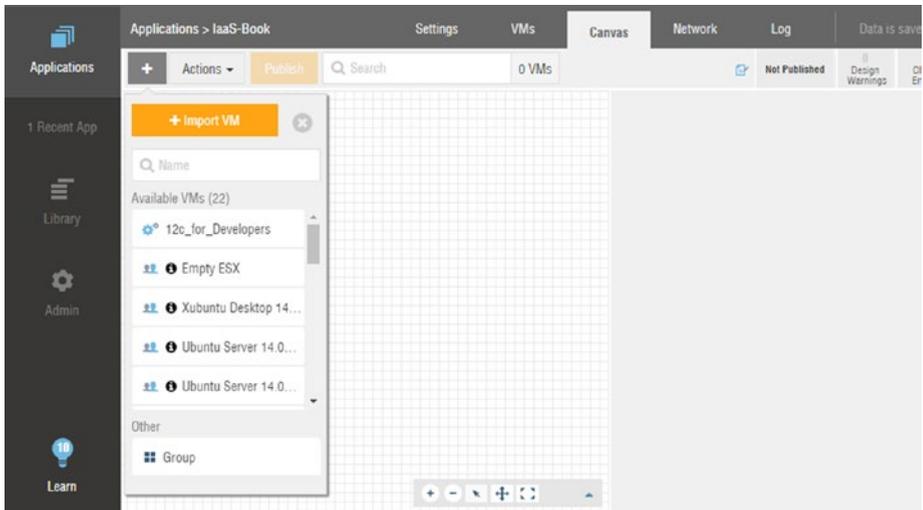


Figure 4-21. *Importing VM*

23. After dragging and dropping a VM into your application canvas, a network is automatically created for you. You can see your cloud network setup on the Network tab (Figure 4-22).

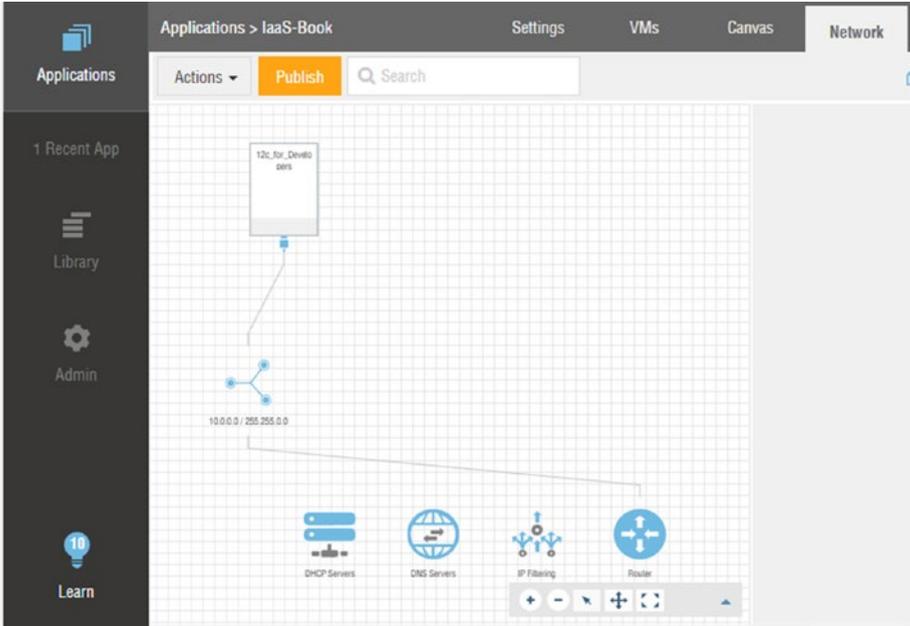


Figure 4-22. Network tab

- 24. Before you can start (“publish,” in Ravello terminology) your application, make sure that all errors are resolved, by clicking on your canvas. If there are any errors, there will be a red warning area at the top of your canvas. Click it to see what the issues are and solve them, until there is no longer a red area.

Now, click the Publish button to start your application (Figure 4-23).



Figure 4-23. Publish

- 25. Before starting the environment, Ravello will present you with an overview of your application, for example, a section with CPU, RAM, and Disk space. It will give you the choice to select a data center (at an additional cost) or to let Ravello decide.

The screen also allows you to automatically stop an environment (for cost-saving purposes) and will give you an overview of the costs per hour for this setup (Figure 4-24).

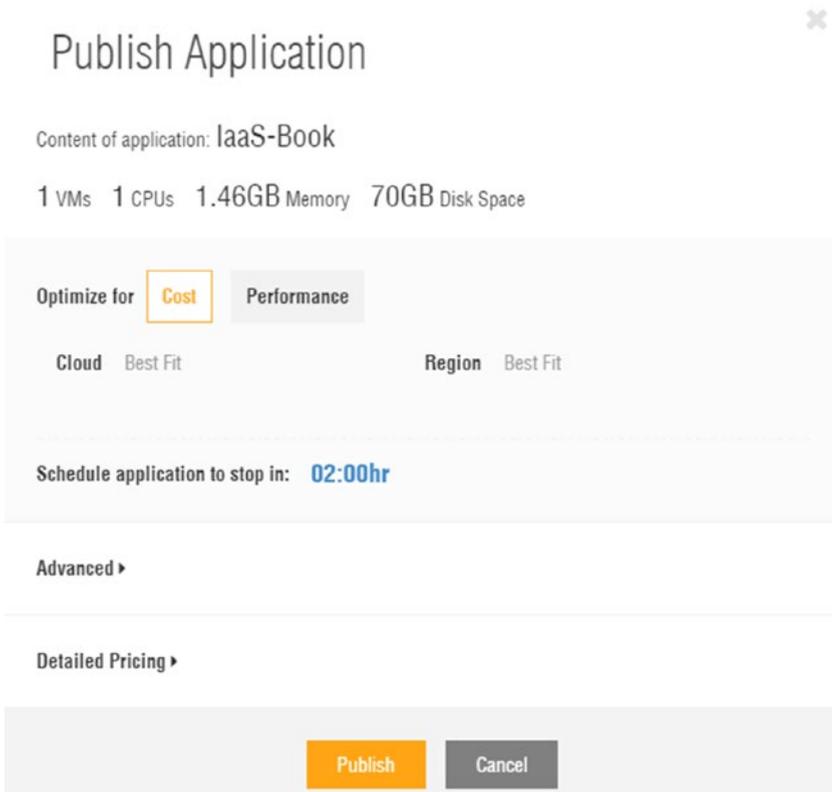


Figure 4-24. Publish Application

If you agree with the review and the costs displayed, click the Publish button again, to deploy (and start) your application.

26. Once a VM is running, you can connect to the OS console display using the console button (Figure 4-25).

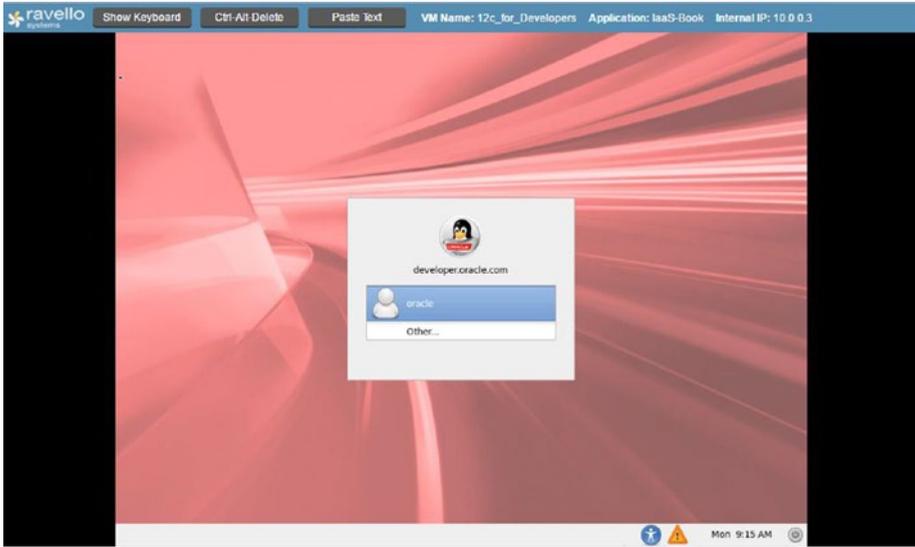


Figure 4-25. Monitor

Blueprint

After creating the perfect setup with perhaps many application VMs connecting to a cluster of database VMs (or simply one very well-created VM), you might want to save the setup for future use or for easy duplication. Ravello can do this by saving your application setup as a so-called Blueprint. The Blueprint consists of the relationship of the VMs in the application but also contains a snapshot of the disk of the VMs in the Blue Print in the state (so with the same contents and status) they had at the time of the Blueprint. First, open your application (canvas). You can now click Save as Blueprint, to make a copy of your application setup (Figure 4-26).

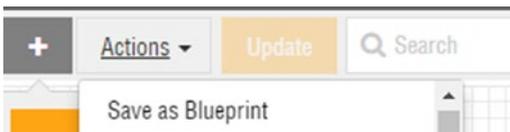


Figure 4-26. Blueprint

There are two ways of getting Blueprint to select options and write names (Figure 4-27).

1. *Shutdown First:* This is recommended for taking an image, because a conflict could arise when taking an image.
2. *No Shutdown:* If a VN can't be closed, you can select this option.

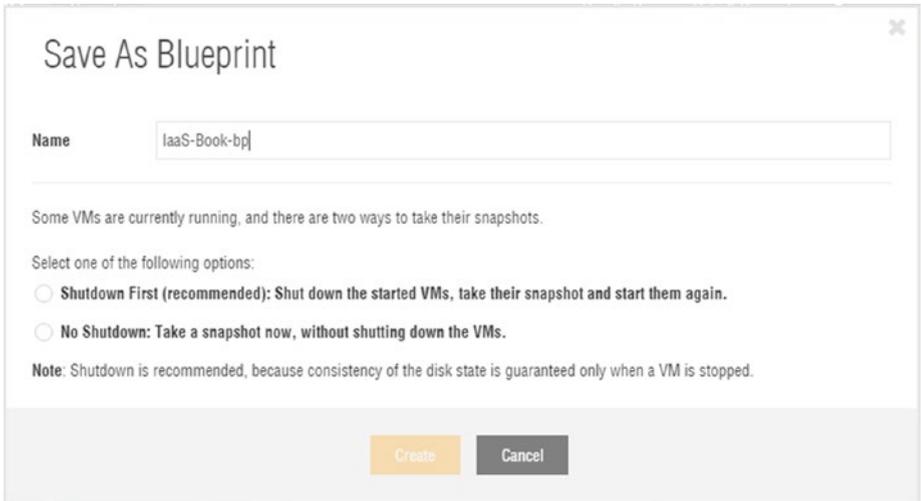


Figure 4-27. Saving as blueprint

As a demonstration, save the current application as a Blueprint called “IaaS-Book-bp,” after first shutting down the started VMs. We will use this Blueprint in the following steps.

1. Your Blueprint will be stored in your library. A screen shows Blueprints that are available for use (Figure 4-28).



Figure 4-28. Blueprints library

When you have sufficient access rights, you can share blueprints with your colleagues or publish them on Ravello Marketplace. Make sure that you have the blueprint saved in your library, as we will use it in the next step.

2. Under Library, click Blueprints and select your recently created blueprint. A drag-and-drop canvas will appear, similar to the application canvas. This screen displays the contents of the blueprint.
3. To start this blueprint (again), we must convert it into an application. The original blueprint will stay in our library for future use. Select Create Application, to start a new application based on our previously created blueprint (Figure 4-29).

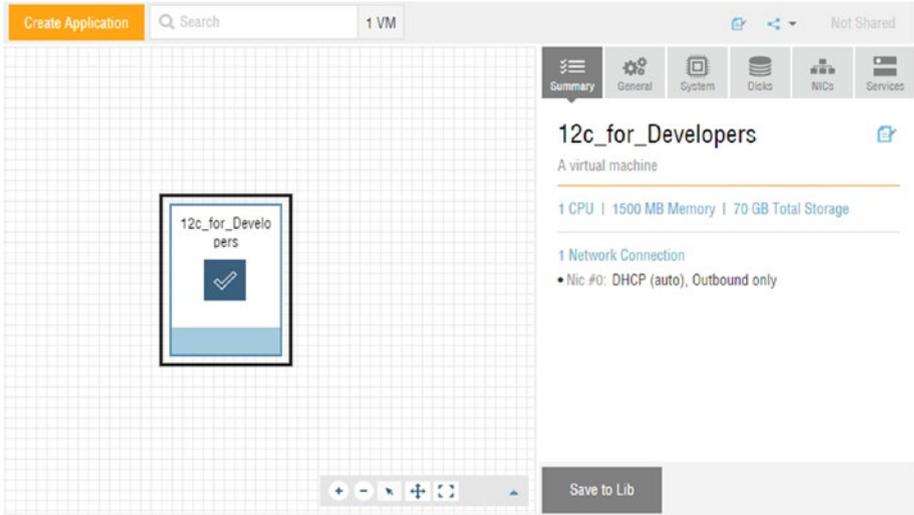


Figure 4-29. Dashboard

4. Specify the application name for building the new application and click Create (Figure 4-30).

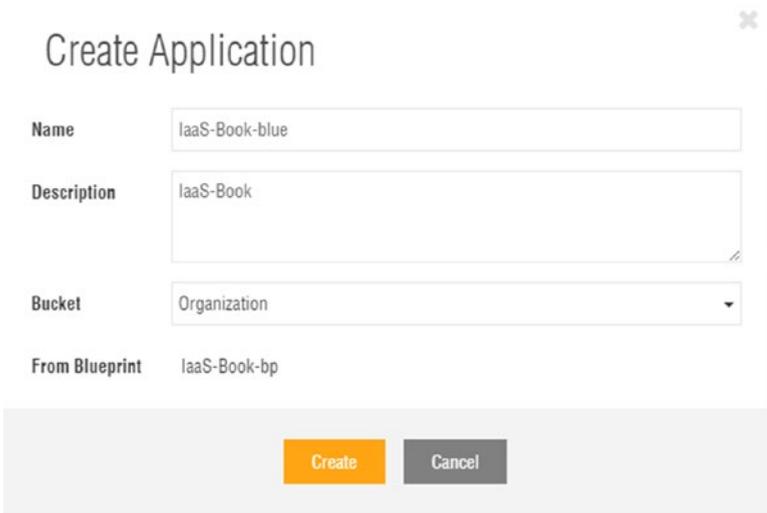


Figure 4-30. Create Application

5. The blueprint will now be copied and made available as an application. You can now start (publish) your application that was based on a blueprint (Figure 4-31).

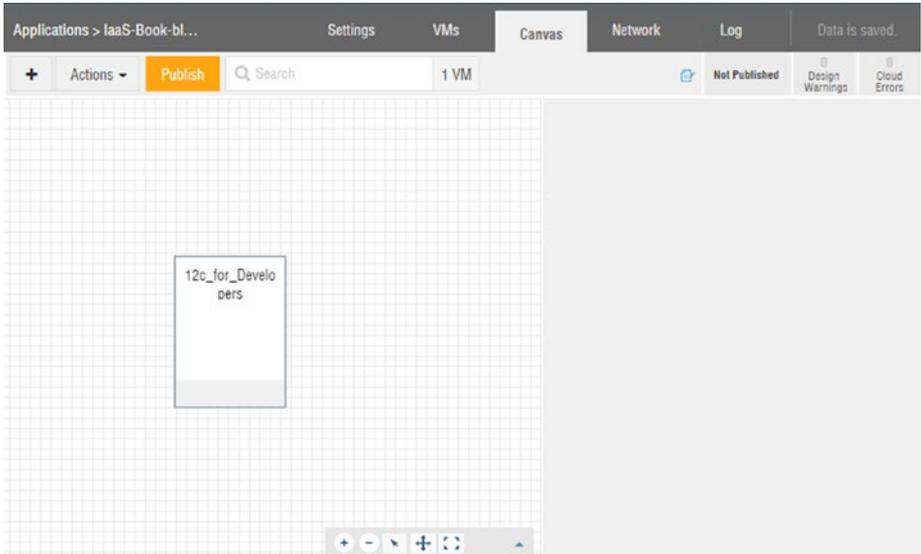


Figure 4-31. *Readying the blueprint*

The same blueprint can be used over and over again, as many times as you require them to refresh your environment or as many times as you need them in parallel for training or testing. All network settings, hostnames, and other options will be the same. The only things that change are the Internet-facing IP addresses.

Summary

Oracle Ravello is a tool for simulating, testing, training, and demoing IT environments. Oracle uses Ravello to simulate information technology environments in enterprise companies. This chapter showed you how to check your system for using any cloud solution. Oracle Ravello offers easy solutions to accommodate your cloud requirements. In addition, the service supports customers' VM uploads through a tool to scale according to reality-based metrics. Using Ravello will make many projects more useful and time-efficient, so that they are positioned more accurately and money will not be wasted. In the next chapter, we will explore the container cloud service and its uses.

CHAPTER 5



Container Cloud

Today, many web applications are released in the cloud, to provide service through the public Internet. Ten years ago, all of these applications were hosted on a hosting service on a virtualized machine. Whenever a new machine was needed in the cloud, this new machine was only generated by a service provider. However, some customers didn't want to give this permission. Therefore, Docker changed this with a new-generation virtualization solution that was particularly useful to startup companies.

Docker is an open source project that manages multiple virtual images in a service. Docker provides continuous integration and continuous deployment, particularly with GitHub and Jenkins, for improving development flow. Docker creates clone machines in a few minutes from the cloud. This saves customers time, as they can create new machine configurations, such as hardware, network, etc., with a few clicks, without burdening their customers with an additional workload. Docker is developed with multiple layers, including infrastructure, operating, and Docker system. Therefore, all such items are unified at a single point.

The Docker system provides virtualized service geared to develop applications in multiple IT environments. Traditionally, IT systems are not transparent to other services, but Docker supports transparency between cloud machines. For example, if you have one machine for developing Java and WebLogic, but this system no longer accepts an additional workload, normally you might have to create and configure one machine again, causing much time to be spent on this process. Furthermore, the project might expire as the result of a time-related issue. Therefore, the Oracle Container Cloud Service is designed to provide a high degree of availability and scalability.

Docker architecture is divided into two parts:

1. *Container*: The Docker container is managed by the Container service, and this service's main aim is to manage all Docker images, so that they work properly with one another.
2. *Image*: A Docker image is created for building new services, such as an application server, database, and other IT applications, and this image aims to work applications on container. Furthermore, all images are working on a container, thus disks will be saved.

Docker Architecture

Docker has a unique design (Figure 5-1), although it offers multiple products for the IT world. Traditional virtual machine (VM) servers don't support API-based solutions to create and manage new virtual machines. Docker is powered by the cloud, thus developers don't need comprehensive knowledge to manage the service. Docker works with two main elements.

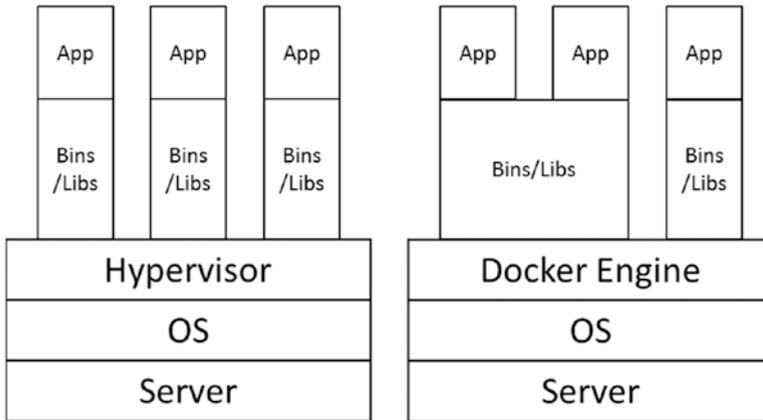


Figure 5-1. Differences between the VM and Docker container

1. *Namespace:* This service aims to isolate service and control this isolation.
2. *Cgroups:* This service adjust resource size to work properly within a system.

Oracle Cloud Container

Oracle understood Docker technologies' power to add value to cloud solutions, thus Oracle's interest in how to easily manage Docker services through third-party cloud service. Oracle Cloud services helps users to make containers, and this service offers the ability to create services quickly and easily, thereby increasing a company's productivity. This service uses special production, testing, and pre-production environments. Oracle Container Cloud Service's main aim is to manage Docker and improve control for systems to work properly.

- *Management:* As you know that time is an important asset for productivity, if you have to set up Docker on infrastructure quickly, Oracle Container Cloud helps to sets up Docker in a few clicks.
- *Configuration:* Oracle offers flexibility to change Docker infrastructure.

Following is how the service is created:

1. Container Cloud is released by Oracle. Click Container Cloud Service (Figure 5-2).

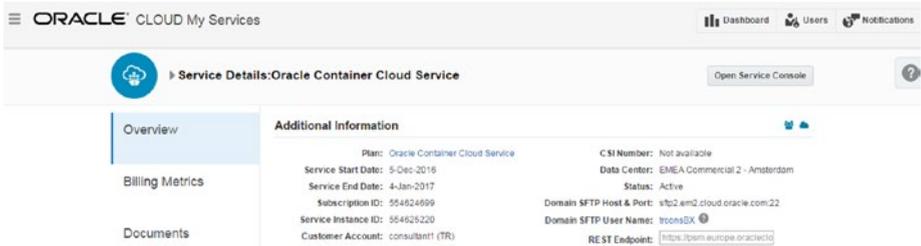


Figure 5-2. Oracle Container Cloud Service Console

The overview page indicates the starting date, ending date, and CSI number.

- **Starting Date:** This information shows the create machine time. Start your service time until your end time.
 - **End Date:** This information shows the ending service time.
 - **Datacenter:** This information shows which data center keeps your data.
 - **Customer Account:** Cloud owner name
 - **Status:** This information indicates the status of the cloud.
2. Check your container billing metrics for using the service (Figure 5-3).

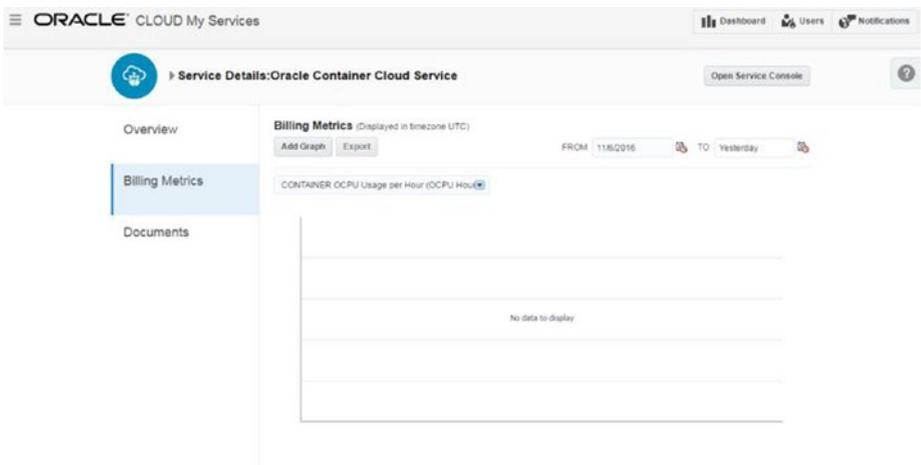


Figure 5-3. Metrics for billing

3. Click Open Service Console on Overview and Welcome to Container Cloud Service (Figure 5-4).

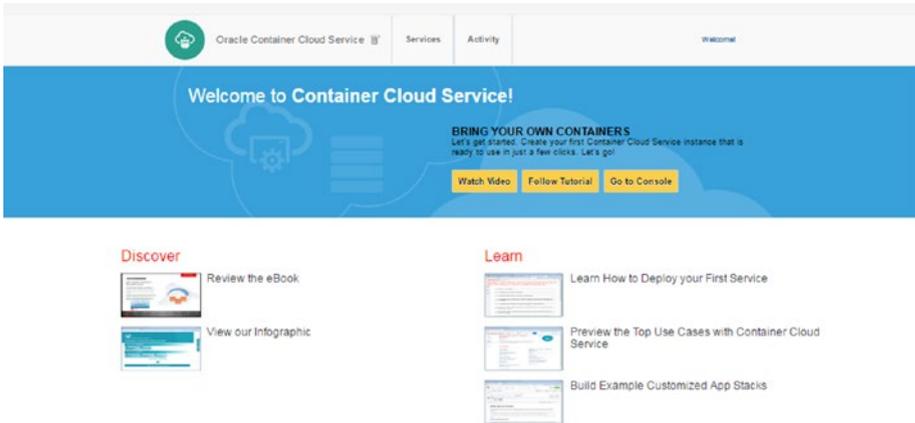


Figure 5-4. Services

4. Check your container service status in the Services section (Figure 5-5).

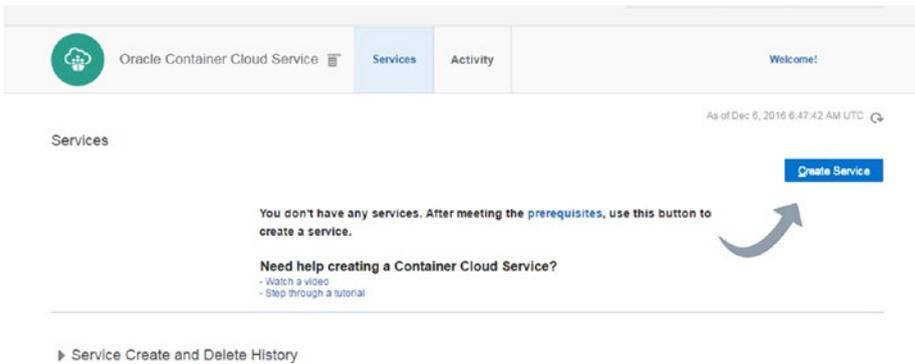


Figure 5-5. Checking container service status

5. Check your container service activity in the Activity section (Figure 5-6).

Use this page to search and review activities of Cloud Services in your identity domain.

Search Activity Log

Start Time Range: 12/5/2016 6:57 AM Search to Time Service Name: Service Type: Oracle Container Cloud Service Operation: All

Search Reset

Results per page: 10 1 result(s) as of Dec 6,

Service Name	Service Type	Operation	Status	Start Time	End Time
containertest	Oracle Container...	Create Service	Running	Dec 6, 2016 6:53:50 AM UTC	

Figure 5-6. Monitoring activity

6. Create a container service with the Create Service button (Figure 5-7).

Oracle Container Cloud Service
Create Service

Cancel Service Details Confirm Next

Service
Provide basic service instance information.

* Service Name containertest This is the unique name used to identify the service in the tenant domain

Service Description test

* SSH Public Key ssh-rsa AAAAB3NzaC1yc2EAAA Edit

Figure 5-7. Services

7. Enter the public key from the keys generated. (Chapter 2 explains how to generate SSH.) (See Figure 5-8.)

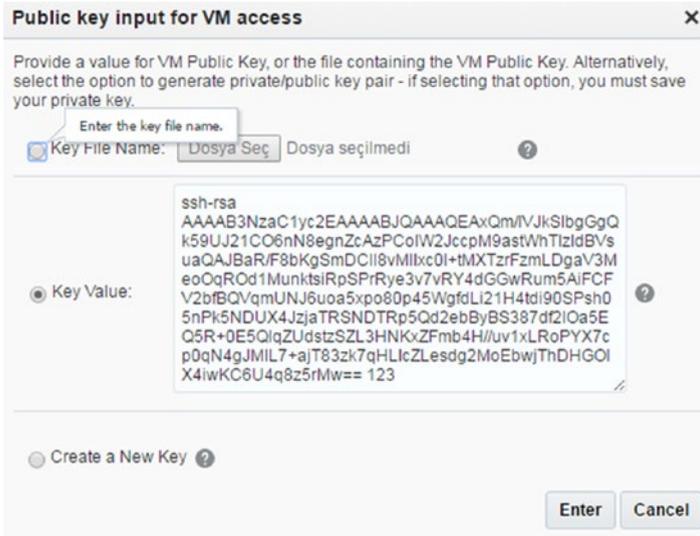


Figure 5-8. SSH

8. Specify the admin password, compute shape, and data volume (Figure 5-9).
 - *Admin password:* This password specifies the administrator password for accessing the service.
 - *Compute Shape:* This section specifies CPU and RAM sizes.
 - *Master node:* This node is for managing worker nodes and orchestrations nodes.
 - *Worker node:* This node is responsible for different resource pool managing requests.

Oracle Container Cloud Service
Create Service

Previous Cancel Service Details Confirm Next

Service Details
This service includes 1 management node [Selection Summary](#)

OCCS Configuration

- * Admin Username:
- * Admin Password:
- * Confirm Admin Password:
- * Worker node Compute Shape:
- * Number of worker nodes:
- * Worker node data volume size (GB):

Figure 5-9. Details

9. Check selection summary at top right (Figure 5-10).

[Selection Summary](#)

Selection Summary

Service Level: Service with tooling support
Service with tooling support

Billing Frequency: Hourly Subscription
Hourly billed subscription to Oracle Container Cloud Service

Software Release: Oracle Container Cloud Service, Release 16.4.2
Oracle Container Cloud Service, Release 16.4.2,
Installed on Oracle Linux 6.6

Software Edition: Standard Edition 16.4.2
Standard edition 16.4.2

Figure 5-10. Selection Summary

10. Check your service to confirm your configurations (Figure 5-11).

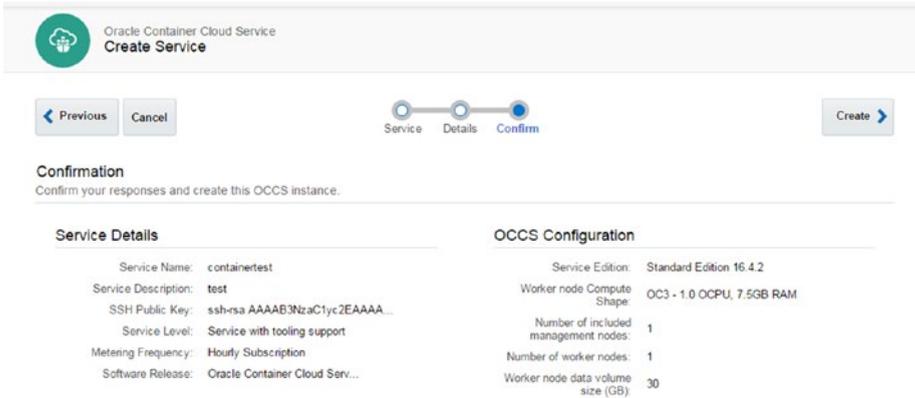


Figure 5-11. Confirmation of configurations

11. Check your machine status (Figure 5-12).

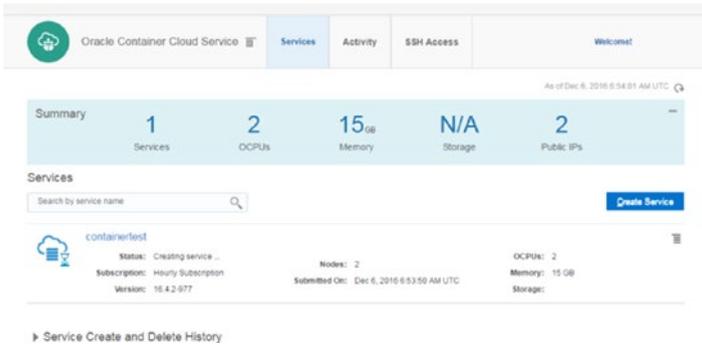


Figure 5-12. Services status

12. Finally, the created service is ready to use (Figure 5-13).

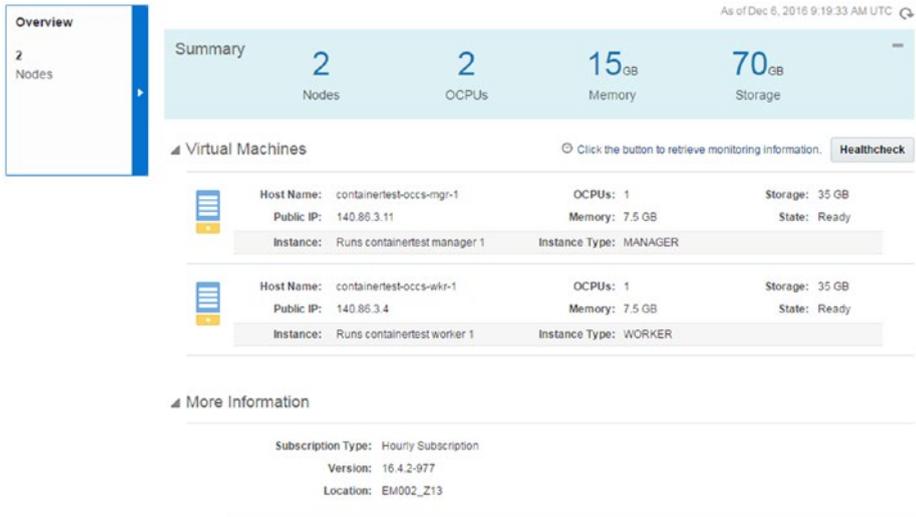


Figure 5-13. Service overview

13. Log in with your credentials (Figure 5-14).
 - *Username:* This service provides a default username, which is admin.
 - *Password:* The password you specify.

ORACLE®

Username

Password

Login

Contact your Service Administrator for access.

Figure 5-14. Panel

14. Check your service status from the dashboard (Figure 5-15).

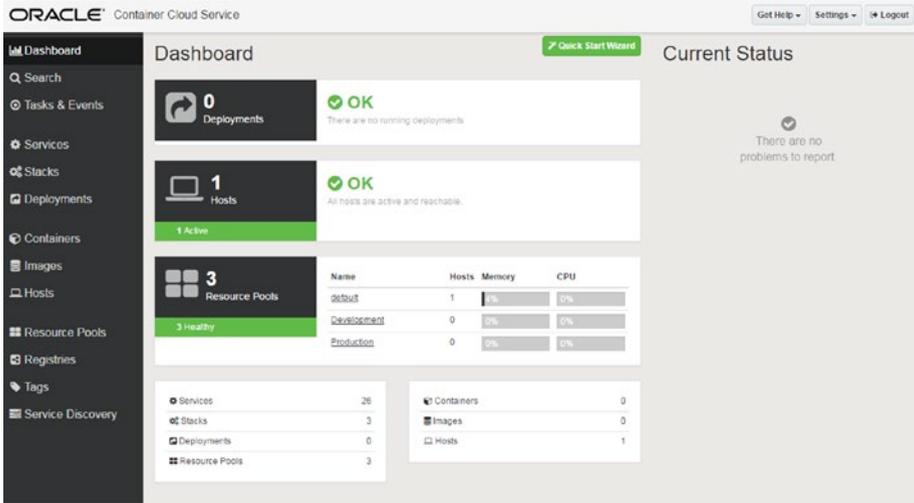


Figure 5-15. Dashboard

15. First, add the new registry by clicking the New Registry button (Figure 5-16).



Figure 5-16. Registries

16. Fill in the information for registering the system (Figure 5-17).

- **URL:** A URL can be added from the Docker account or a specific registry domain.
- **Username:** Required login information
- **Password:** Required login information
- **Email:** Registered e-mail address

Edit Registry ✕

Email	URL
<input type="text" value="username@domain.com"/>	<input type="text" value="Example: index.docker.io"/>
Username	Password
<input type="text" value="Registry username"/>	<input type="password"/>
	Description
	<input type="text" value="Example: Docker Hub"/>

Figure 5-17. Edit Registry

17. Click Resource Pools and create a pool for Docker (Figure 5-18).

The screenshot shows the Oracle Container Cloud Service dashboard. The left sidebar contains navigation options: Dashboard, Search, Tasks & Events, Services, Stacks, Deployments, Containers, Images, Hosts, Resource Pools, Registries, Tags, and Service Discovery. The main content area is titled 'Pools > test'. It displays a table with the following information:

ID	Description	Combined Memory	Combined CPU
test	pool	0%	0%

Below the table, there is an 'Add Tag' button and a row of action buttons: 'Edit', 'Move Hosts', and 'Remove'. To the right of the table, there are two summary cards: a green card showing '0 Active Hosts' and a grey card showing '0 Inactive Hosts'. At the bottom of the main content area, there is a pagination control showing 'Page 1' and 'Per Page: 20', and a search bar. The footer of the page contains the version number 'v16.4.5-1014 ©2016 Oracle and/or its affiliates. All rights reserved.'

Figure 5-18. Pool

18. Enter your details for building a new pool, which creates resources for deploying services across different hosts (Figure 5-19).

New Pool [X]

Name

ID

Description

Cancel Save

Figure 5-19. New Pool

19. Click Move Hosts under Resource Pools (Figure 5-20).

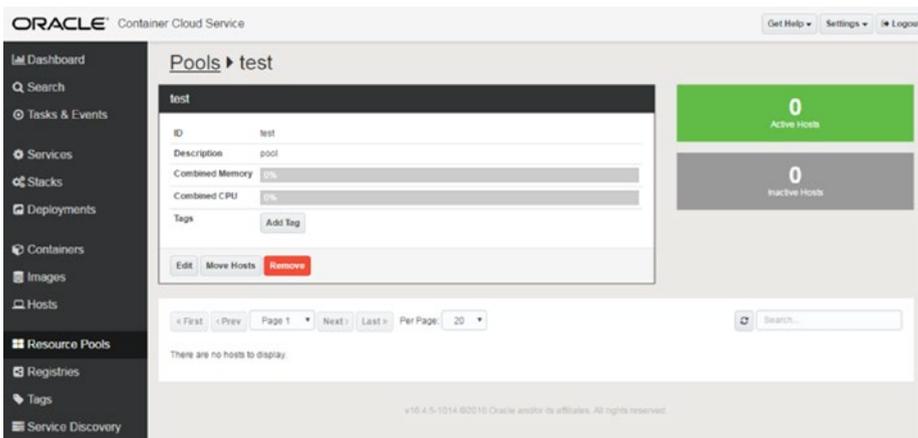


Figure 5-20. Resource Pools

20. Select a hostname and click Add Selected Hosts (Figure 5-21).

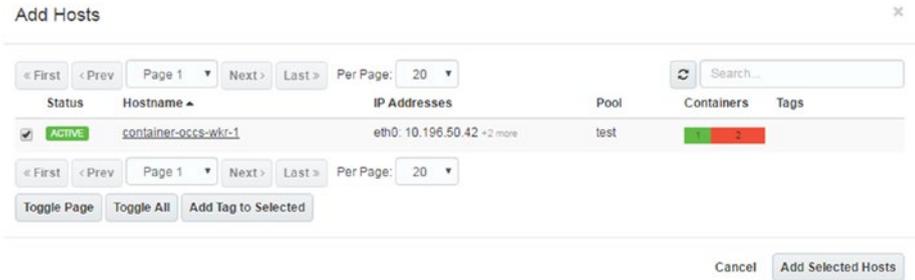


Figure 5-21. Hosts

21. Finally, specify hostname in Pools (Figure 5-22).

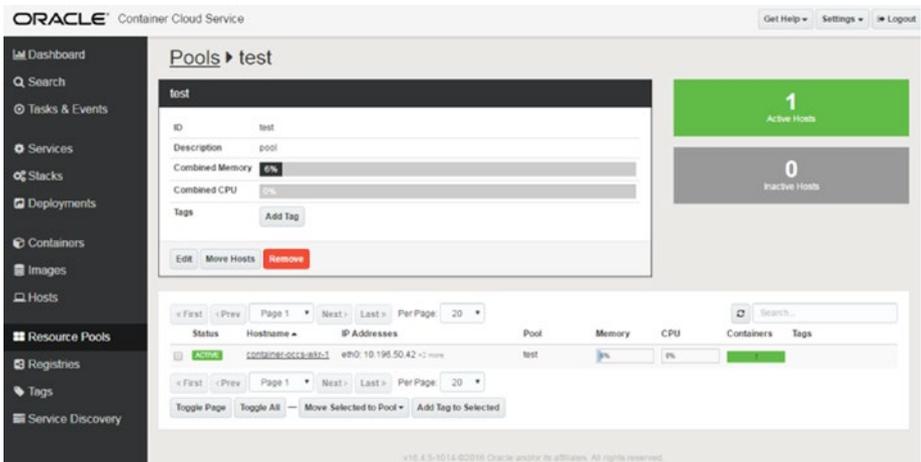


Figure 5-22. Pools

22. Click the Services section to deploy the service. This service shows all the preconfigured services that use the Oracle Container Cloud Service container console (Figure 5-23).

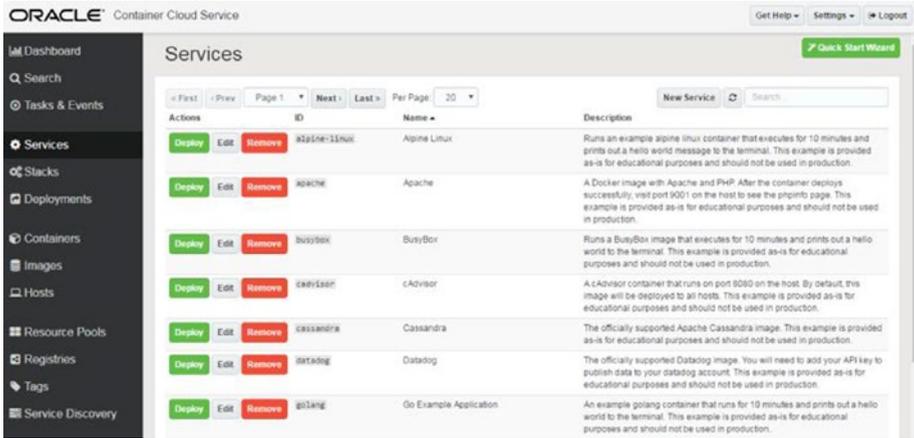


Figure 5-23. Service

23. Fill in the blanks with information, especially the service name and Docker run command for starting the service. Oracle Container Cloud works with different methods, such as Docker RUN, Docker Compose(YAML), and User Interface views (Figure 5-24).

Service Editor ×

Service Name
Service ID
Health Check No health checks defined.

Service Description Optional

Scheduler
Availability

Docker Run Command
This is a docker run command that can be executed to launch this service manually through Docker. Paste a docker run command here to turn it into a service.
The current version of Docker supported is 1.10.3. To learn more about supported Docker Run commands, click [here](#).

```

docker run \
  -p=80:80/tcp \
  "ysnsygl/ysnsygl:latest"
  
```

Docker Run Validation:
 No validation errors

Figure 5-24. Service Editor

24. Click the Deploy button (Figure 5-25).



Figure 5-25. Deploy button

- 25. The system asks the deployment resource pool for this sample and selects your built resource pool (Figure 5-26).

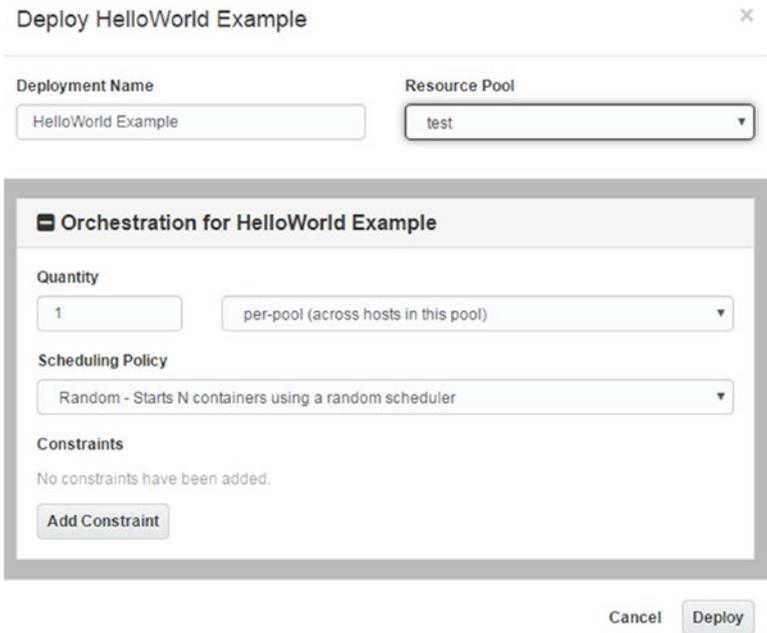


Figure 5-26. Example

- 26. Finally, click the Deploy button (Figure 5-27).



Figure 5-27. Deploy button

Summary

In this chapter, I explained what the container service is and how to use it. You've seen how to facilitate interactions between Oracle and Docker. Oracle supports new-generation startup technologies, and it has built new cloud applications, using the Docker architecture. As you know, Oracle Container Cloud supports management and configuration of the Docker system, and Oracle also harnesses the power of open source technology. Oracle tries to accommodate other open source technologies and will continue to support open source software and software development environments.

CHAPTER 6



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39. https://docs.oracle.com/cloud/latest/computecs_common/OCSUG/GUID-9ABA08E2-DF6B-45C9-BF14-6AC915EA0B61.htm#OCSUG148.
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44. <https://docs.oracle.com/cloud/latest/stcomputecs/STCSG/GUID-0C04E7C5-0D24-4D16-9D83-92EC1E737622.htm#STCSG-GUID-0C04E7C5-0D24-4D16-9D83-92EC1E737622> ---Snapshotr.
45. <https://docs.oracle.com/cloud/latest/stcomputecs/STCSG/GUID-7F3C0A24-5108-4279-BC72-8D516AF9DA42.htm#STCSG-GUID-261DFAB3-E9C7-4919-95A2-066B250B6BFB> --- schedule backup.
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