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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



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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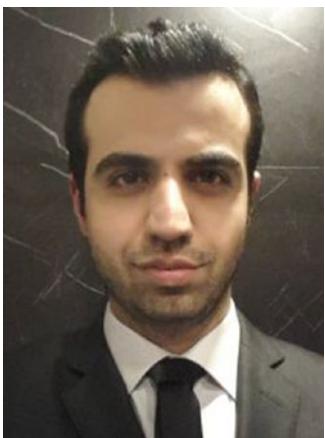
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About the Author



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).

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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.

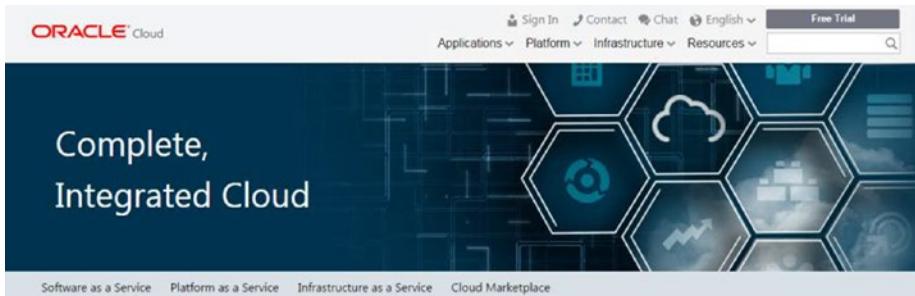
Getting Started: Oracle Cloud with a Trial Account

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).

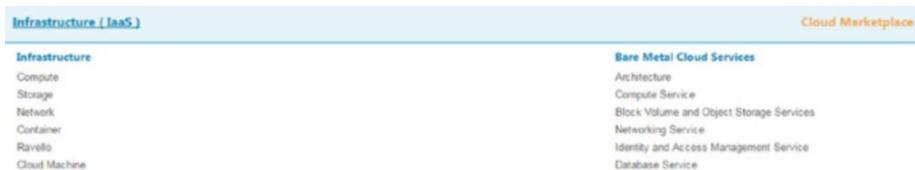


Figure 1-2. IaaS menu

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.

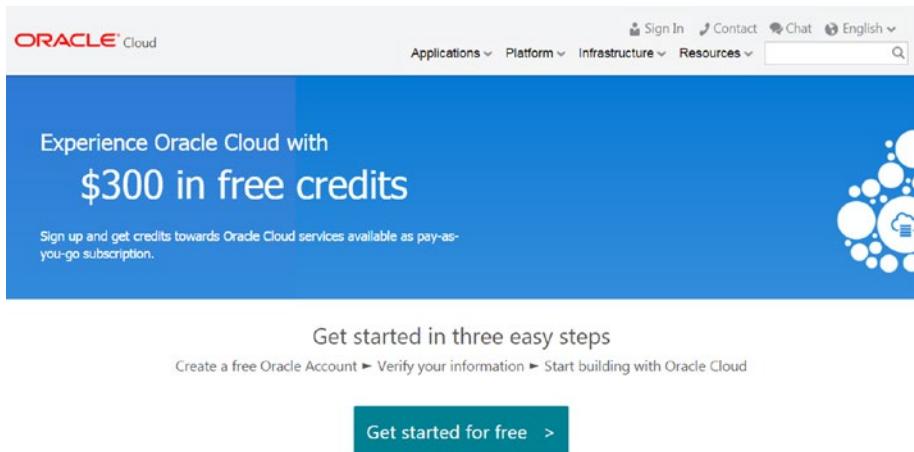


Figure 1-3. Free trial button

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).

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	Java	Compute	Developer
Database Backup	Storage	Application Container	SOA

Contact Details

* First Name: yasin
* Company: consultant1 (TR)
* Last Name: saygili

Verification Code

* Country Calling Code: Turkey (+90) * Mobile Number: +90
Request Code Enter Verification Code: Enter code from text message

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: Create New Account trconsulta
I understand and accept Oracle's Terms and Conditions

Cancel Sign up

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).

The screenshot shows an Oracle Cloud confirmation email. At the top, it says "ORACLE Cloud". The body of the email starts with "Hello okcan," followed by a message about being the primary administrator for Cloud Services. It includes instructions for configuration and provisioning, and a note about accepting Oracle's Terms and Conditions. Below this, there's a section titled "Access Details" with three main items: "User Name and Temporary Password", "My Account Administration", and "My Services Administration", each with its own icon and descriptive text.

Hello okcan,

You're the primary administrator for your **Cloud Services**. This includes My Account Administration and My Services Administration. As the administrator, you're the only person who receives these **cloud service notifications** for your organization.

Some services may require additional configuration and provisioning steps before they're ready for production usage. See the details below for more information.

By accessing the service you confirm acceptance of **Oracle's Terms and Conditions**.

Your access details, including your user name, temporary password and identity domain name, are included below. As a service administrator you can manage administrative functions related to your **Cloud Services**, including configuring and managing service instances and performing monitoring and management tasks related to individual services.

Access Details

User Name and Temporary Password

Use these credentials to sign in to My Services and your Service Console URL.

Username: **vTJ7S30c**
Temporary Password: **vTJ7S30c**
Identity Domain:

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/dashboard.jspx>
Username: Use your Oracle account user name.
Password: Use your Oracle account password.

My Services Administration

Sign in to My Services to monitor this trial environment, including usage data and status.

My Services URL: <https://myservices.us.oraclecloud.com/mycloud/usthetalen79012/faces/dashboard.jspx>
Identity Domain: **usthetalen79012**

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).

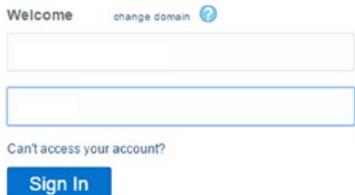


Figure 1-7. Sign in

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

The screenshot shows a form for changing a password. It includes three fields for entering the old password and one field for re-typing it. Below these are three questions from a security questionnaire, each with a dropdown menu and an answer field:

- *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

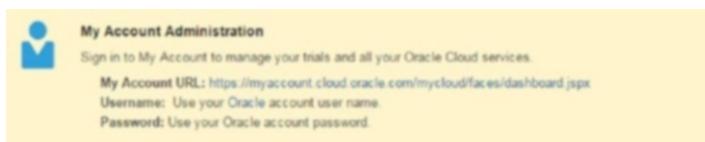
13. Let's try to enter an e-mail address and password for logging in to the cloud account (Figure 1-9).

**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).

**Figure 1-10.** Account administration

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

The screenshot shows the Oracle Cloud Infrastructure Service Catalog. It lists several services under different categories:

- Data Center - EMEA Commercial 2**:
 - OCI Manager - Cloud Monitoring per OCPU**: Details, Service Console, ?
 - SE1 VI OCPU Months (General Purpose)**: no data
 - SE1 VI OCPU Hours (General Purpose)**: no data
 - EE VI OCPU Months (General Purpose)**: no data
 - EE VI OCPU Hours (General Purpose)**: no data
- Oracle Database Cloud Service**:
 - MySQLCS_EE_PAAS_ANY**: no data
- Oracle MySQL Cloud Service**:
 - Storage Capacity**: no data

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).

The screenshot shows a web interface for Oracle Cloud. At the top, there's a header with the "ORACLE Cloud" logo. Below it, a message says "Hello yasin," followed by "The expiry date of your service has been updated. The service will expire in 55 days." A "Subscription Details" section is highlighted with a grey background. It contains a cloud icon and the text "Oracle Database Public Cloud Services" followed by a bulleted list: "Identity Domain: trconsult1" and "Service Expiry Date: Friday, February 3, 2017 4:06 PM CET". At the bottom of the page, there are copyright notices: "Copyright © 2016, Oracle and/or its affiliates. All rights reserved." and links to "About Oracle Cloud | Legal Notices and Terms of Use | Privacy Statement".

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.

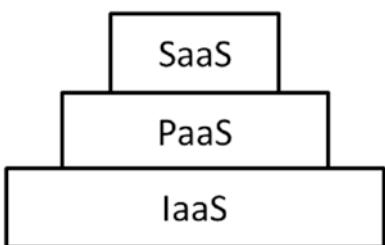


Figure 2-1. IaaS cloud pyramid

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).

Service Details: Oracle Compute Cloud Service

Overview

Additional Information

Plan: Oracle Compute Cloud Service
Service Start Date: 5-Dec-2015
Service End Date: 4-Jan-2017
Subscription ID: 554624699
Service Instance ID: 554625219
Customer Account: consultant1 (TR)

CSI Number: Not available
Data Center: EMEA Commercial 2 - Amsterdam
Status: Active
Domain SFTP Host & Port: sftp2.em2.cloud.oracle.com:22
Domain SFTP User Name: trconsBX
REST Endpoint: <https://api-z13.compute.emr>

Billing Metrics

Resource Quotas

Monitoring Metrics

Documents

Figure 2-2. Clicking Oracle Compute Cloud Service

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

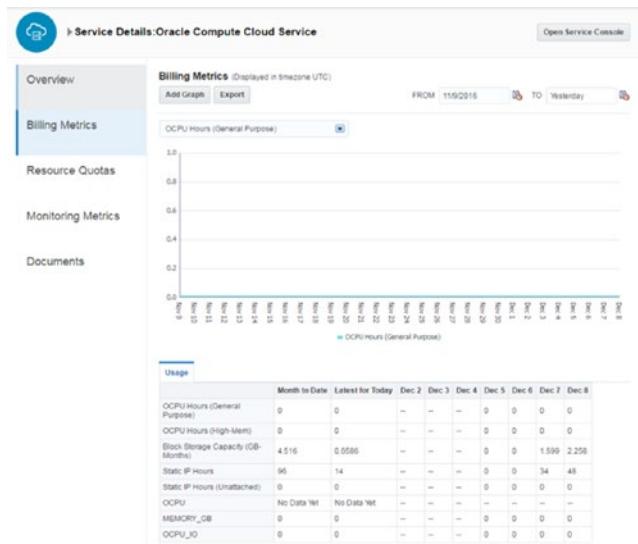


Figure 2-3. Billing Metrics

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

Resource	Amount	Remaining
BLOCK_STORAGE	500	496
EIPs	5	4
OCPU_GP	6	6

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).

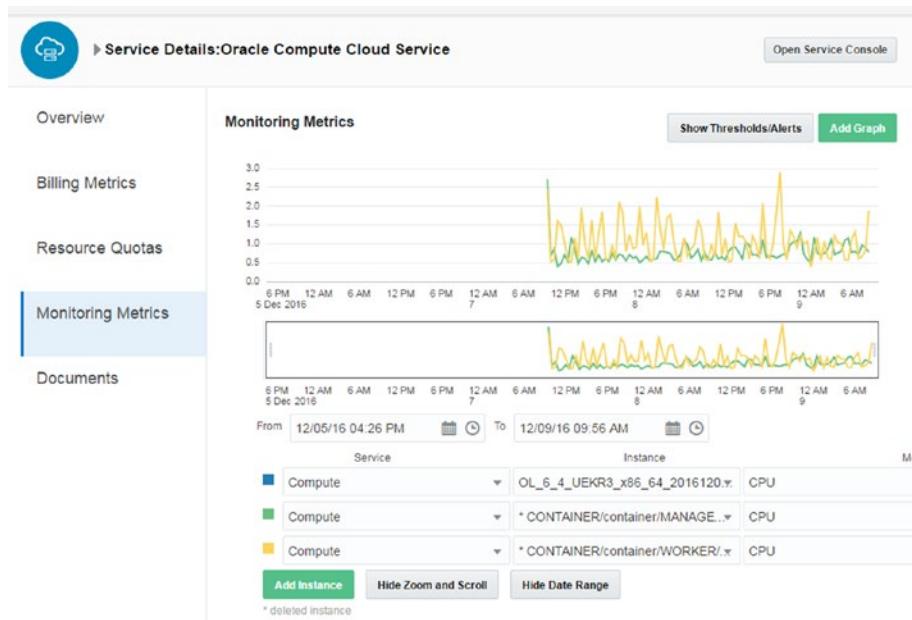


Figure 2-5. Monitoring Metrics

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

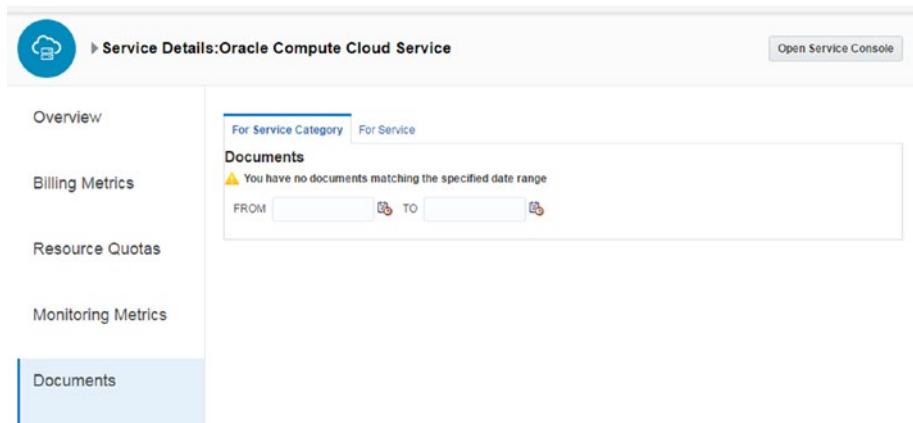


Figure 2-6. Documents

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

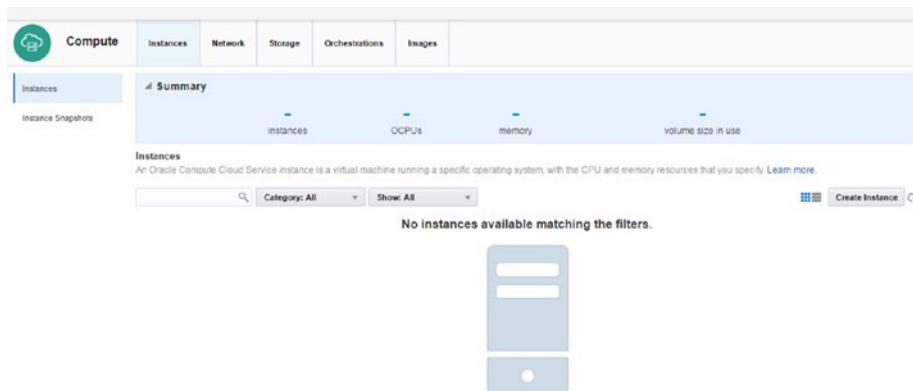


Figure 2-7. Instances dashboard

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

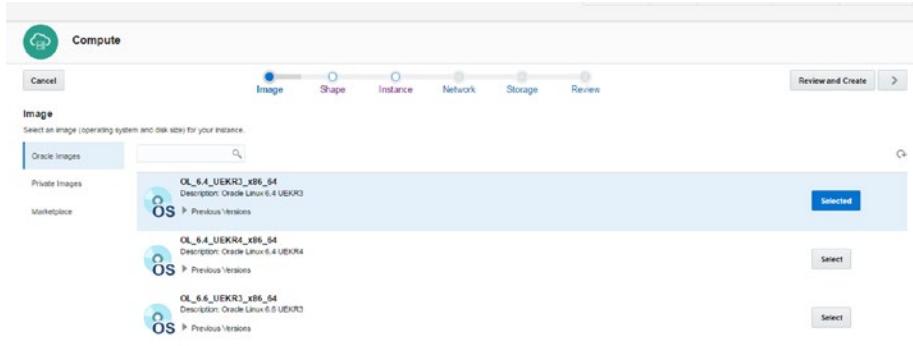


Figure 2-8. Image page

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

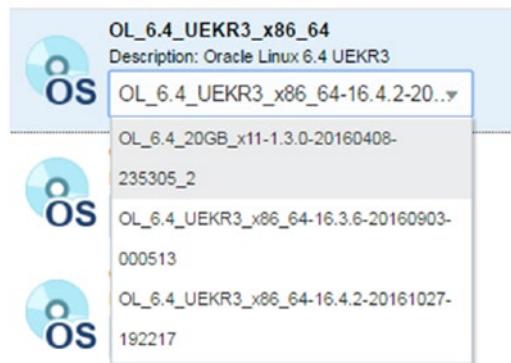


Figure 2-9. Image selection

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

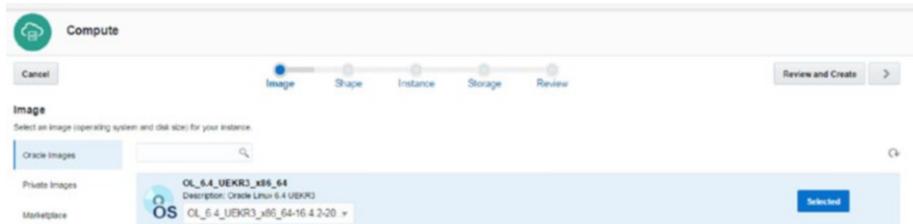


Figure 2-10. Selected button

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).

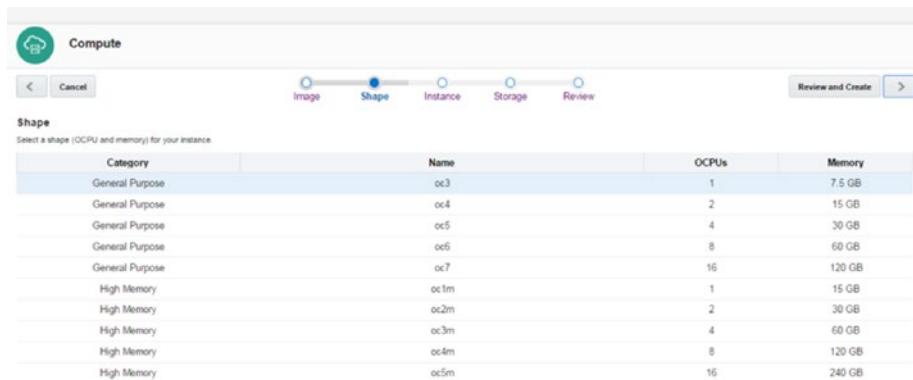


Figure 2-11. Compute ► Shape

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.

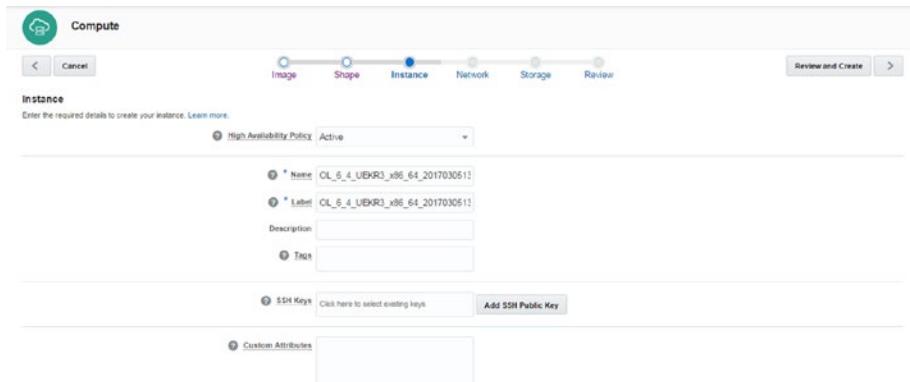


Figure 2-12. Instance configuration

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

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

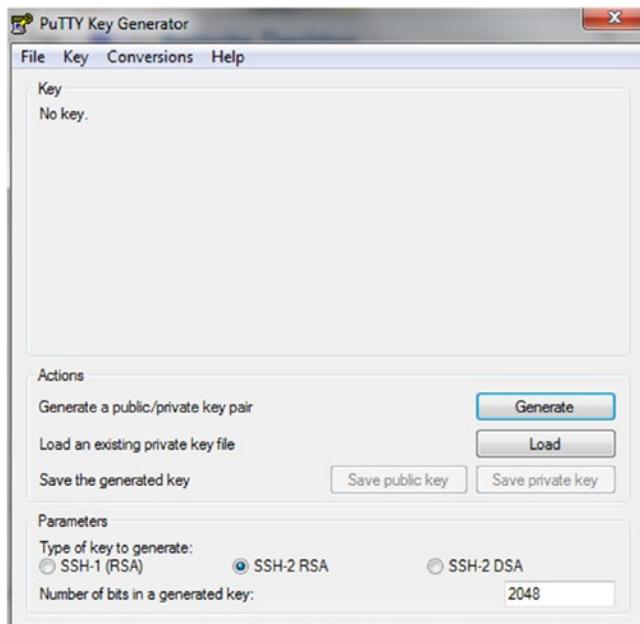


Figure 2-13. Generating the public key

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

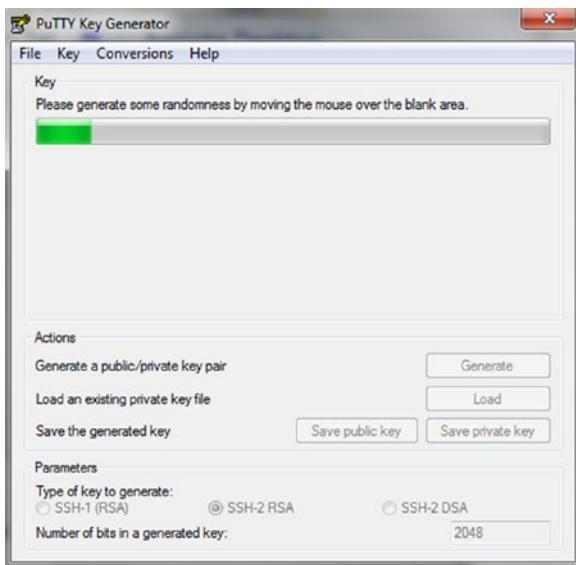


Figure 2-14. Generate key

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.)

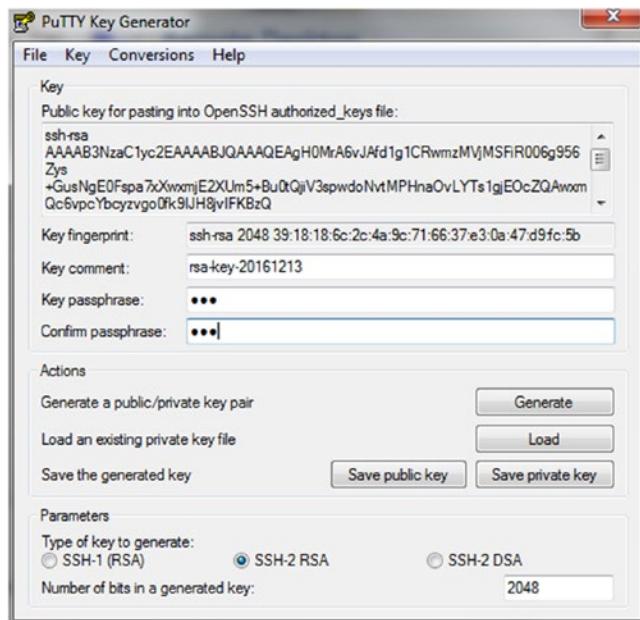


Figure 2-15. Enter passphrase key

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

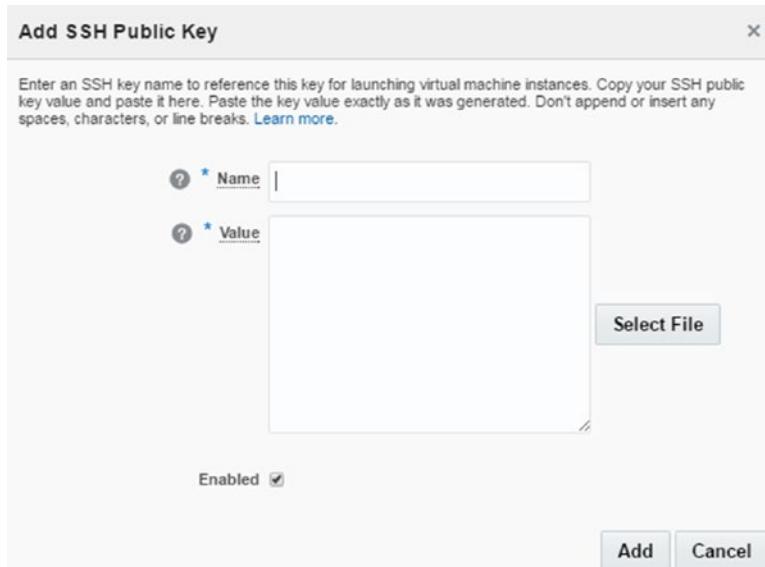
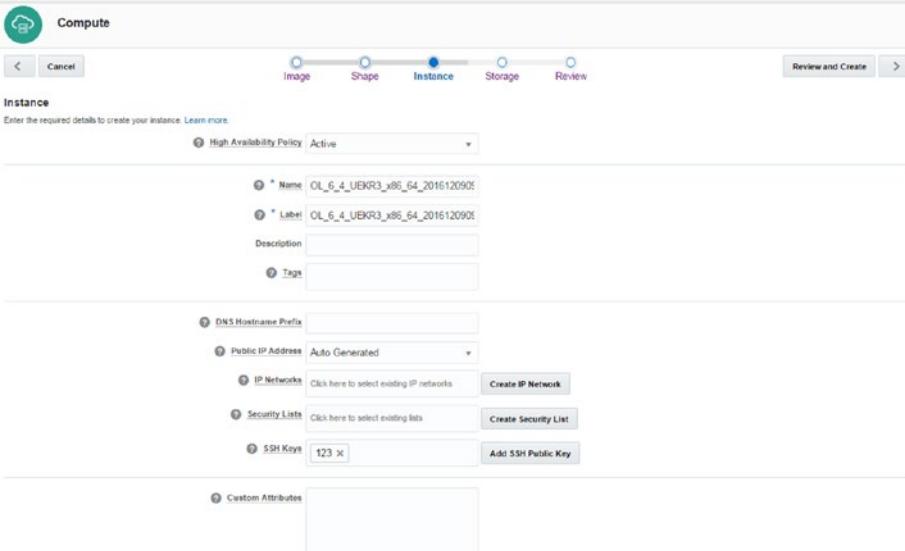


Figure 2-16. Add public key

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



The screenshot shows the 'Compute' service's instance creation wizard at the 'Instance' step. The progress bar indicates the current step is 'Instance'. The 'Review and Create' button is visible at the top right.

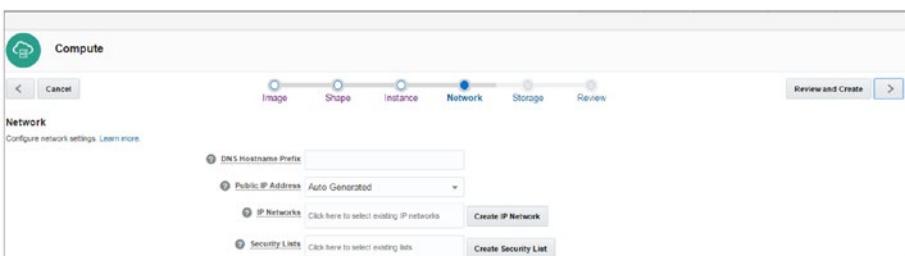
Instance
Enter the required details to create your instance. Learn more.

Name: OL_6_4_UBKR3_x86_64_2016120901
Label: OL_6_4_UBKR3_x86_64_2016120901

Description: (empty)
Tags: (empty)

DNS Hostname Prefix: (empty)
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)



The screenshot shows the 'Compute' service's network creation wizard at the 'Network' step. The progress bar indicates the current step is 'Network'. The 'Review and Create' button is visible at the top right.

Network
Configure network settings. Learn more.

DNS Hostname Prefix: (empty)
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).

The screenshot shows a 'Create IP Network' dialog box. It contains fields for 'Name', 'IP address prefix', 'IP exchange' (set to 'Not Set'), and a 'Description' field. Below the fields are 'Create' and 'Cancel' buttons.

Create IP Network

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.

The screenshot shows a 'Create Security List' dialog box. It contains fields for 'Name', 'Inbound Policy' (set to 'Deny (Drop packets, no reply)'), 'Outbound Policy' (set to 'Permit (Allow packets)'), and a 'Description' field. Below the fields are 'Create' and 'Cancel' buttons.

Create Security List

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.

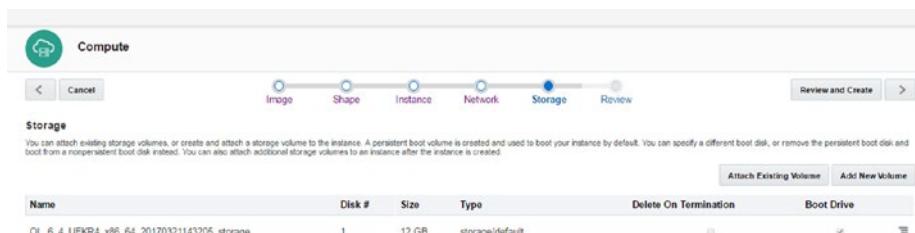


Figure 2-20. Storage

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

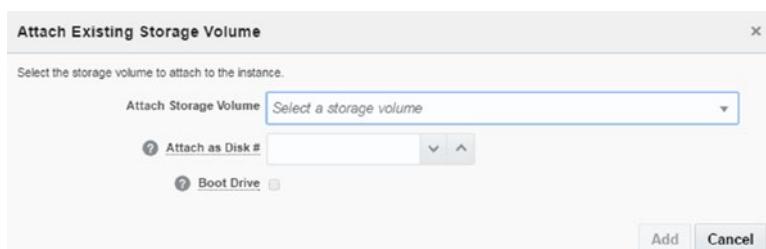


Figure 2-21. Attaching existing storage

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

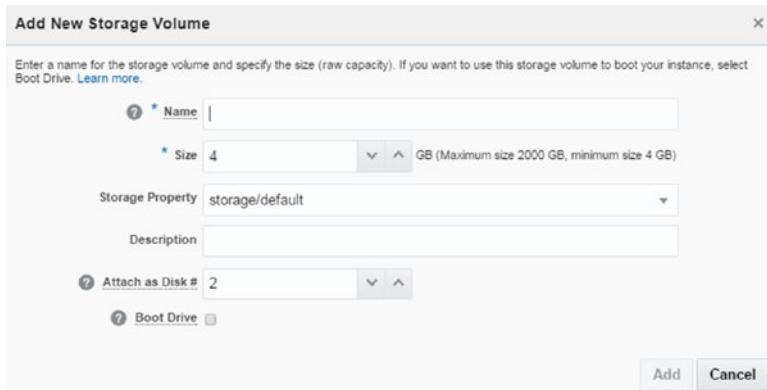


Figure 2-22. New cloud storage

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).

The screenshot shows the Oracle Compute Cloud Service Instance Overview page for the instance OL_6_4_UERK3_x86_64_20161209091125. The page is divided into several sections:

- Information:** Displays basic instance details such as Name, Status, Tags, Shape, Image, Orchestration, OCPUs, Memory, DNS Name, Public IP Address, and Private IP Address.
- Storage Volumes:** Shows a table with one volume entry:

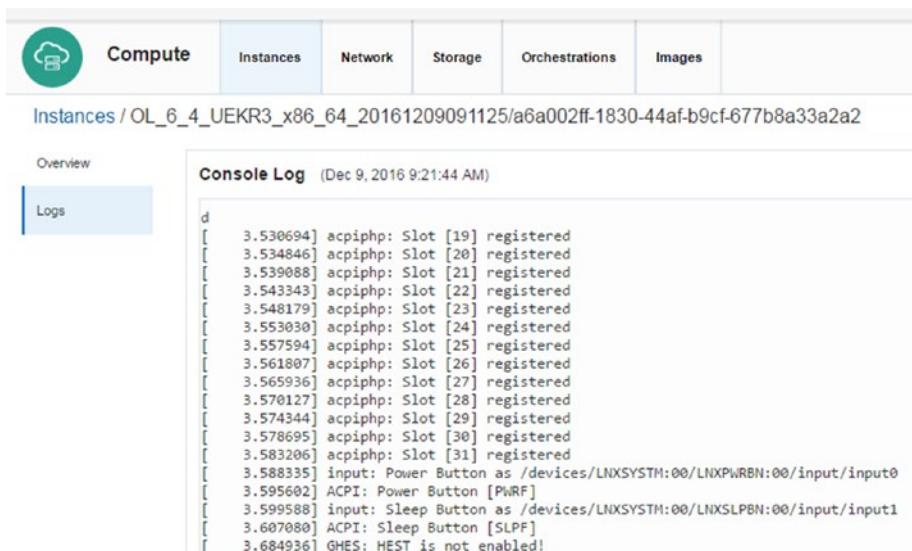
Name	Description	Status	Size	Disk #
OL_6_4_UERK3_x86_64_20161209091125...		Online	4 GB	1
- Security Lists:** Shows a table with one security list entry:

Name	Description	Inbound Policy	Outbound Policy
default		Deny	Permit
- SSH Public Keys:** Shows a table with one key entry:

Name	Status	Key Value
123	Enabled	ssh-rsa AAAAB3NzaC1yc2EAAAQABQAAQCEAxQmVJkSlbgGgQk59UJ21CO6nN5gnZzAdPCoIW2Jc...
- Instance Snapshots:** A button labeled "Create Snapshot".

Figure 2-25. Instance summary

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



The screenshot shows the Compute Cloud interface. At the top, there's a navigation bar with tabs: Compute (highlighted), Instances, Network, Storage, Orchestrations, and Images. Below the navigation bar, the URL is shown as Instances / OL_6_4_UEKR3_x86_64_20161209091125/a6a002ff-1830-44af-b9cf-677b8a33a2a2. Under the Compute tab, there are two sections: Overview and Logs. The Logs section is active, showing the 'Console Log' for Dec 9, 2016 at 9:21:44 AM. The log content is as follows:

```

d
[ 3.530694] acipiphp: Slot [19] registered
[ 3.534846] acipiphp: Slot [20] registered
[ 3.539088] acipiphp: Slot [21] registered
[ 3.543343] acipiphp: Slot [22] registered
[ 3.548179] acipiphp: Slot [23] registered
[ 3.553030] acipiphp: Slot [24] registered
[ 3.557594] acipiphp: Slot [25] registered
[ 3.561807] acipiphp: Slot [26] registered
[ 3.565936] acipiphp: Slot [27] registered
[ 3.570127] acipiphp: Slot [28] registered
[ 3.574344] acipiphp: Slot [29] registered
[ 3.578695] acipiphp: Slot [30] registered
[ 3.583206] acipiphp: Slot [31] registered
[ 3.588335] input: Power Button as /devices/LNXSYSTM:00/LNXPWRBN:00/input/input0
[ 3.595602] ACPI: Power Button [PWRF]
[ 3.599588] input: Sleep Button as /devices/LNXSYSTM:00/LNXPBPN:00/input/input1
[ 3.607080] ACPI: Sleep Button [SLPF]
[ 3.684936] GHES: HEST is not enabled!

```

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.

1. 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).

... Learn more.



Figure 2-27. Creating security rule

2. 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.)

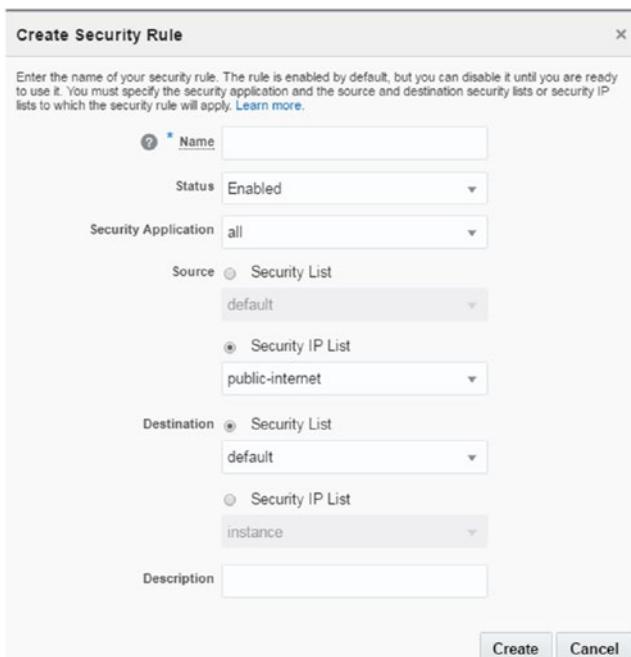


Figure 2-28. Security rule

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

3. 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).

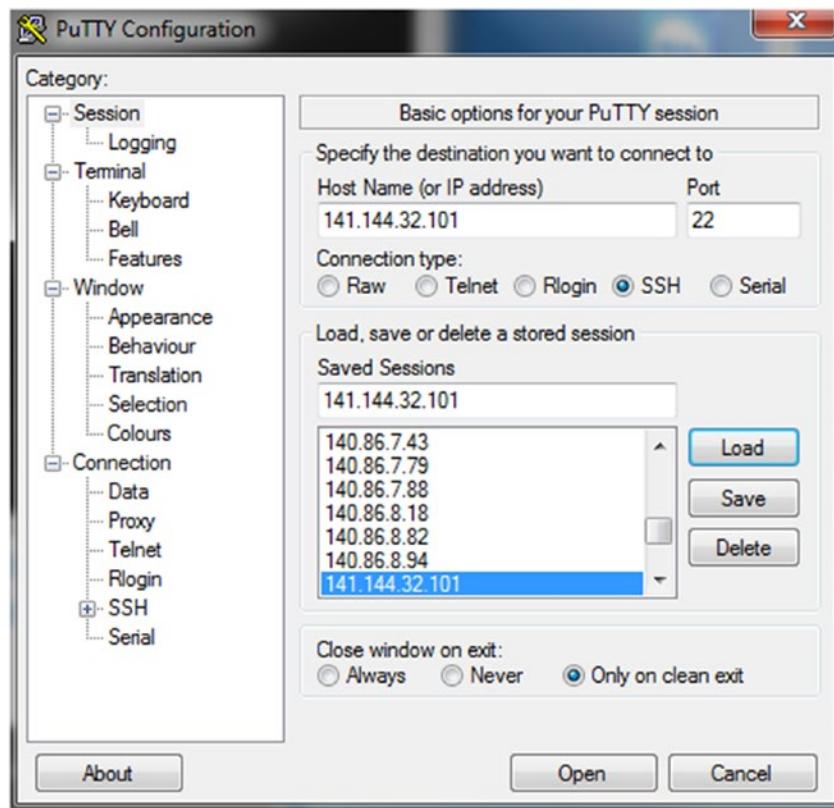


Figure 2-29. PuTTY connection

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

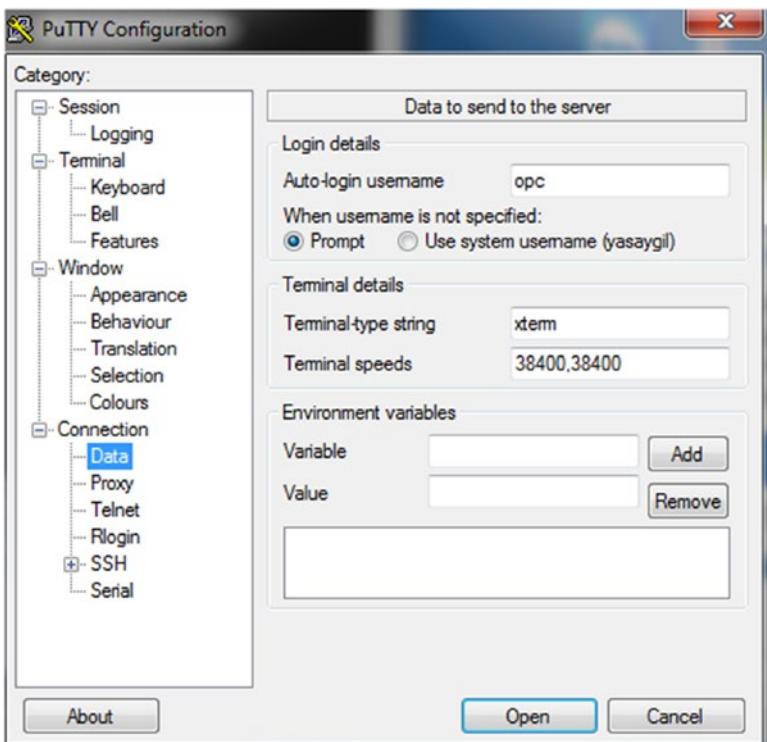


Figure 2-30. Username in Data

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).

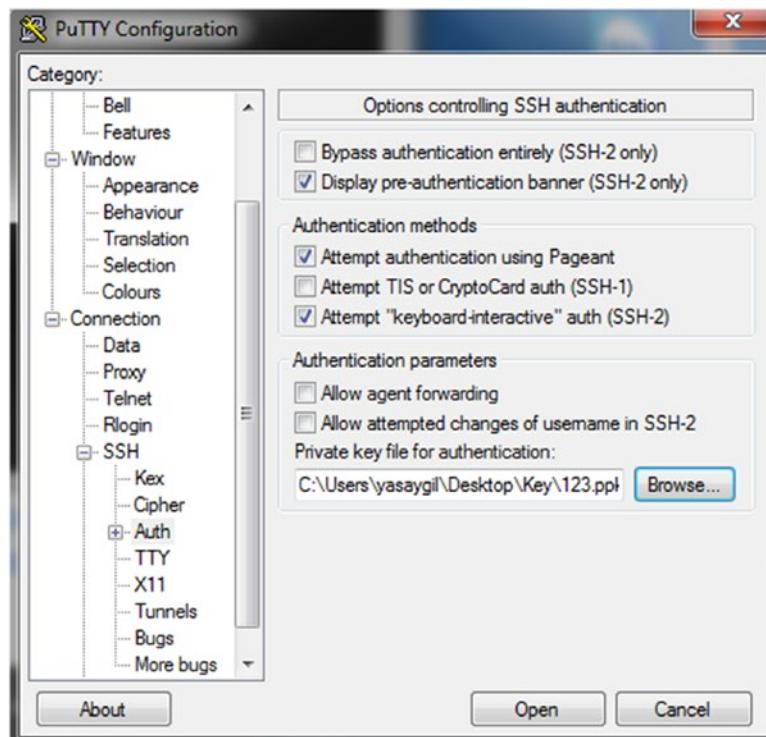


Figure 2-31. Configurating private key

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).

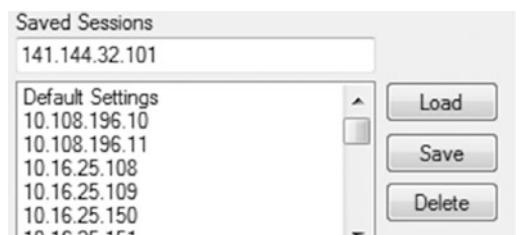


Figure 2-32. IP configuration

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 Orchestrations 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).



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).

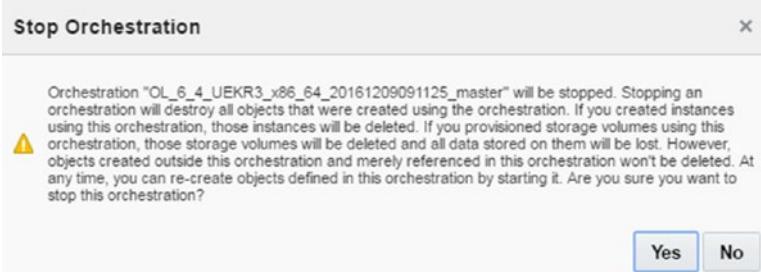


Figure 2-35. Stopping orchestration

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

● Successfully sent request to stop orchestration "OL_6_4_UERK3_x86_64_20161209091125_master".

Figure 2-36. Orchestration request

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

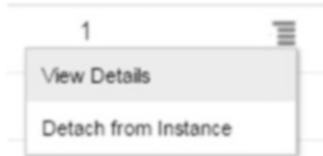


Figure 2-37. Orchestration detach

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 /
UUID=7a51e0aa-31d2-48a0-91d9-783a8b9154d8 /boot
tmpfs /dev/shm
devpts /dev/pts
sysfs /sys
proc /proc
disk /mnt
```

		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).



lory resources that you specify. [Learn more.](#)

[Create Instance](#)

Public IP	Private IP
141.144.32.98	10.196.221.202
141.144.32.122	10.196.161.54

Figure 2-40. Create Instance

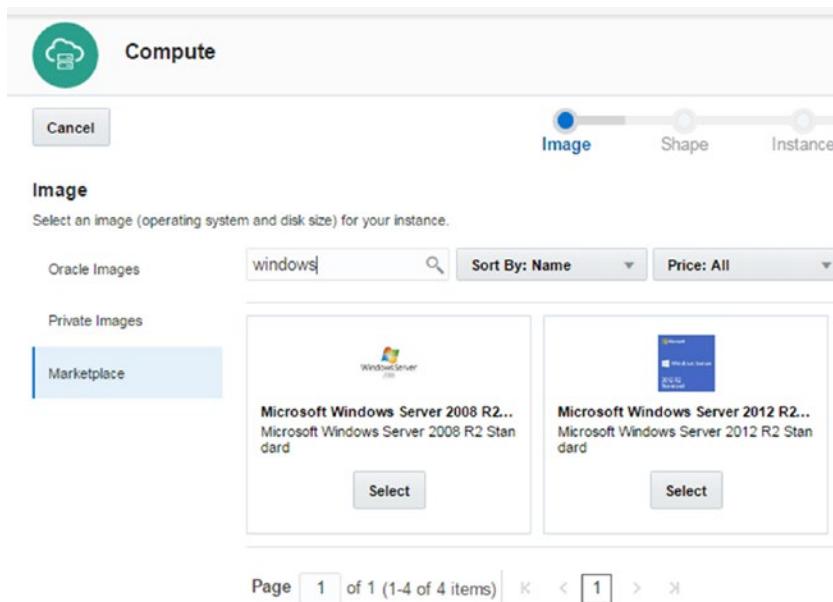
2. Select Market Place (Figure 2-41).

The screenshot shows the Oracle Cloud Market Place interface. It has tabs for Compute, Image, Shape, Instance, Storage, and Review. The 'Image' tab is selected. A search bar and filters for Sort By: Name, Price: All, and Category: All are present. The 'Marketplace' tab is selected. Several software offerings are listed in a grid:

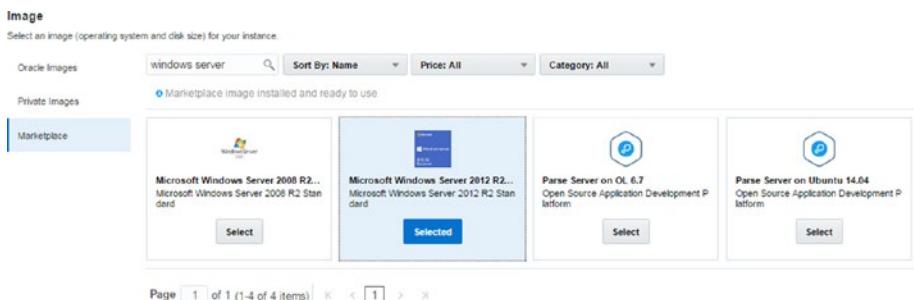
- AbanteCart on OL 6.7 (Open Source ecommerce shopping cart) - Select button
- AbanteCart on Ubuntu 14.04 (Open Source ecommerce shopping cart) - Select button
- Actifio Sky for Oracle Cloud (Database virtualization for faster application development & business resiliency in the hybrid cloud) - Select button
- ActiveMQ on OL 6.7 (Open Source message broker in Java) - Select button
- ActiveMQ on Ubuntu 14.04 (Open Source message broker in Java) - Select button
- Akeneo on OL 6.7 (Powerful PIM designed to simplify management processes) - Select button
- Akeneo on Ubuntu 14.04 (Powerful PIM designed to simplify management processes) - Select button
- Alfresco Community on OL 6.7 (ECM system for easy document management) - Select button

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

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

**Figure 2-43.** Selection

- 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).

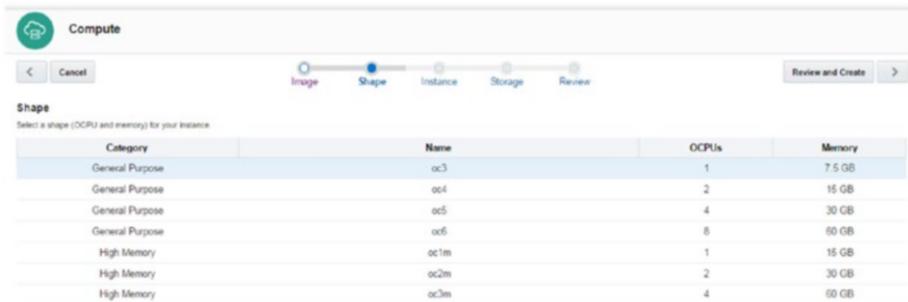


Figure 2-46. Shape

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

The screenshot shows the 'Instance' step of a six-step process (Image, Shape, Instance, Network, Storage, Review). The 'Instance' tab is selected. The configuration fields include:

- High Availability Policy:** Active
- Name:** windows
- Label:** windows
- Description:** (empty)
- Tags:** (empty)
- SSH Keys:** Click here to select existing keys | Add SSH Public Key
- RDP:** Enabled
- Administrator Password:** (empty)
- 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).

The screenshot shows the 'Network' configuration screen. The fields are:

- DNS Hostname Prefix:** (empty)
- 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).

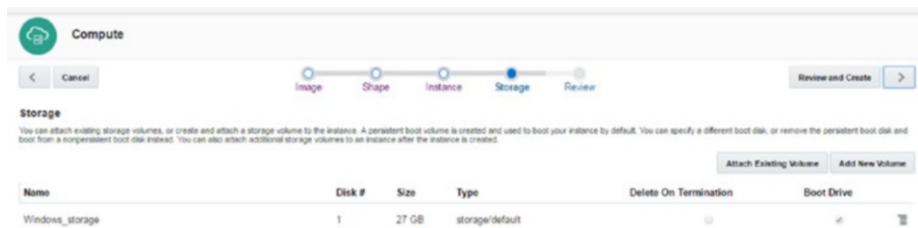


Figure 2-49. Storage selection

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.

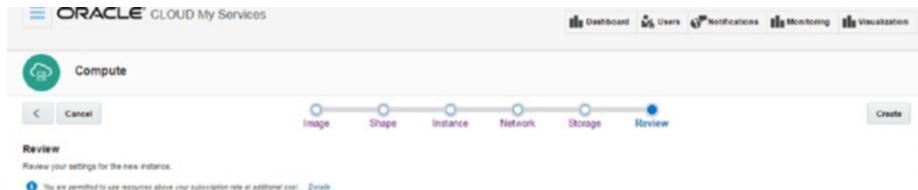


Figure 2-50. Review

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

ORACLE® Cloud Marketplace

Hello ysnsygl ysnsygl,

Thank you for providing the required installation information for compute. We can now install the "Microsoft Windows Server 2012 R2 Standard" app onto the Oracle Cloud services you specified.

Details	
App Name:	Microsoft Windows Server 2012 R2 Standard
Provided by:	Oracle
Install to:	trconsult1 (trconsult1)

We'll send you another email when the app is installed and ready to use.

Have questions about this install? Send an email to marketplace-help_us_grp@oracle.com.

Thank you,
Oracle Cloud Marketplace

Important: This is a system-generated message. Do not reply to this message.
For further assistance, click Contact Us on [Oracle Cloud Marketplace](#).

[About Oracle](#) | [Contact Us](#) | [Legal Notices](#) | [Terms of Use](#) | [Your Privacy Rights](#)
For more information about Oracle Cloud Marketplace, go to [Oracle Cloud Marketplace](#).

Figure 2-51. Confirmation e-mail

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

ORACLE® Cloud

Hello yasin,

The Microsoft Windows Server Standard application machine image is available in your Compute account for creating VM instances. Sign in here to continue the application installation using the Compute Console.

Subscription Details	
	Oracle Compute Cloud Service
	<ul style="list-style-type: none"> Subscription ID: 554624699 My Services: https://myservices.emea.oraclecloud.com/mycloud/trconsult1/faces/dashboard.jspx Compute Console URL: https://computeui.emea.oraclecloud.com/mycompute/console/instances.html Application Machine Image: Microsoft_Windows_Server Data Center: EMEA Commercial 2 Identity Domain: trconsult1

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.)

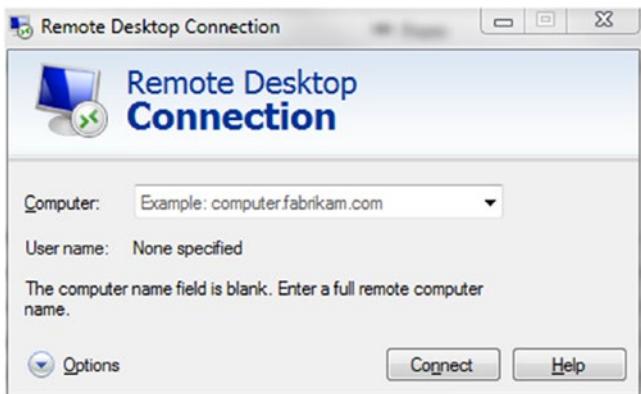


Figure 2-53. Remote Desktop Protocol

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).

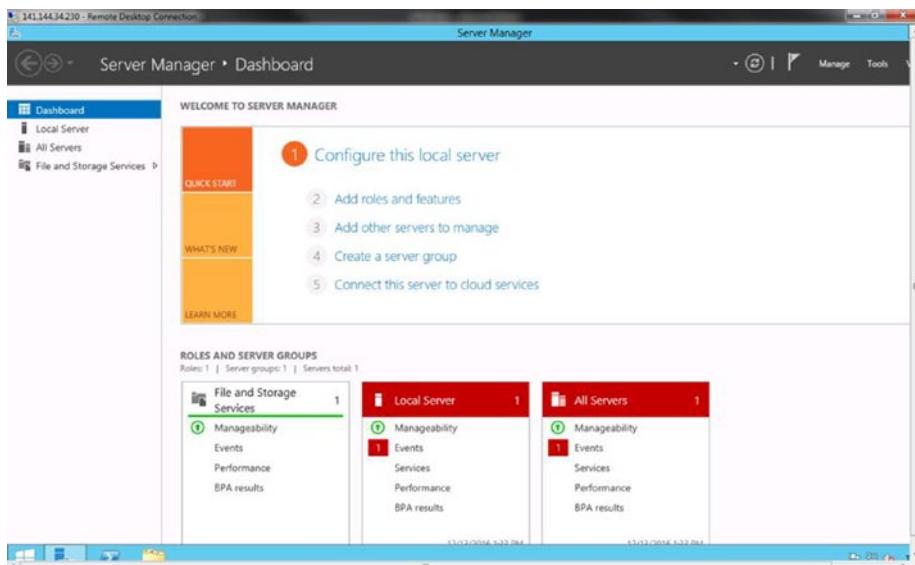


Figure 2-56. Windows server

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.)

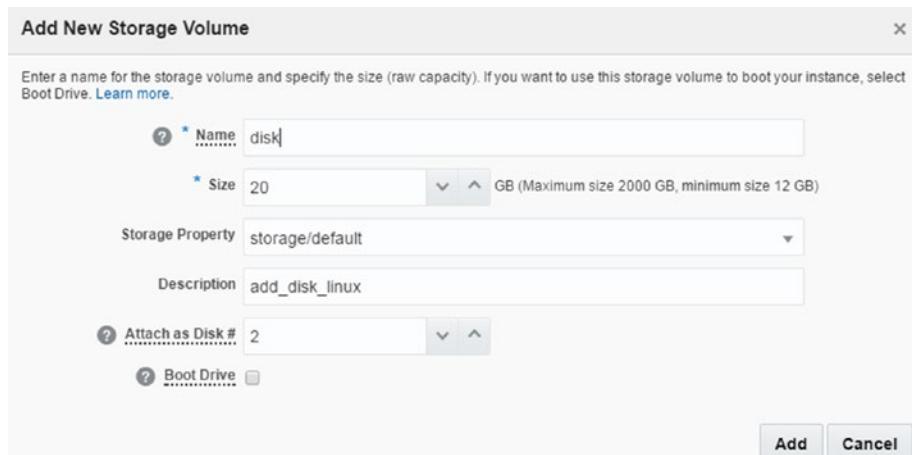


Figure 2-57. Adding storage volume

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

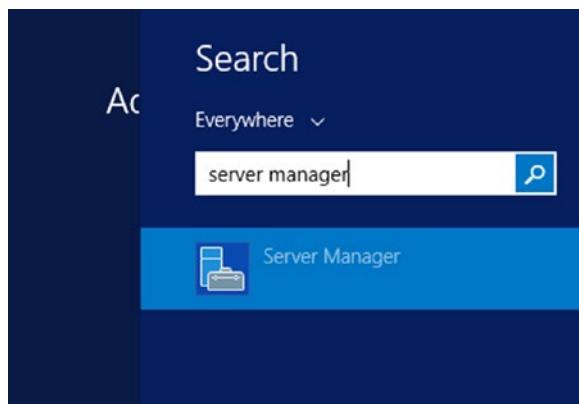


Figure 2-58. Search server manager

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

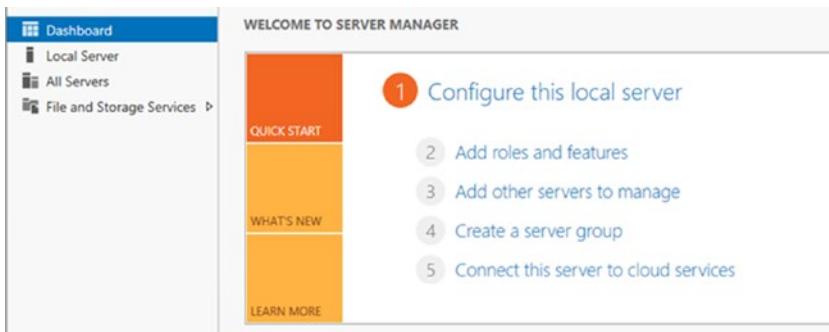


Figure 2-59. Configuring Server Manager

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

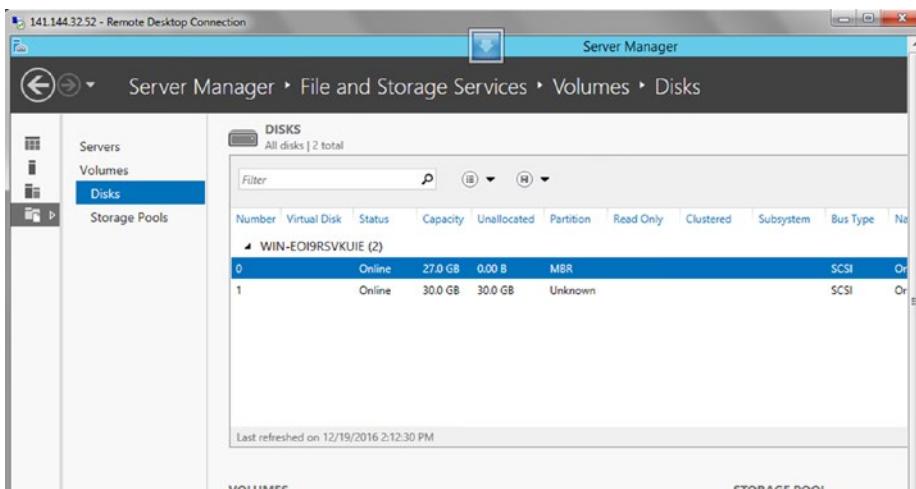


Figure 2-60. Disks manager

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

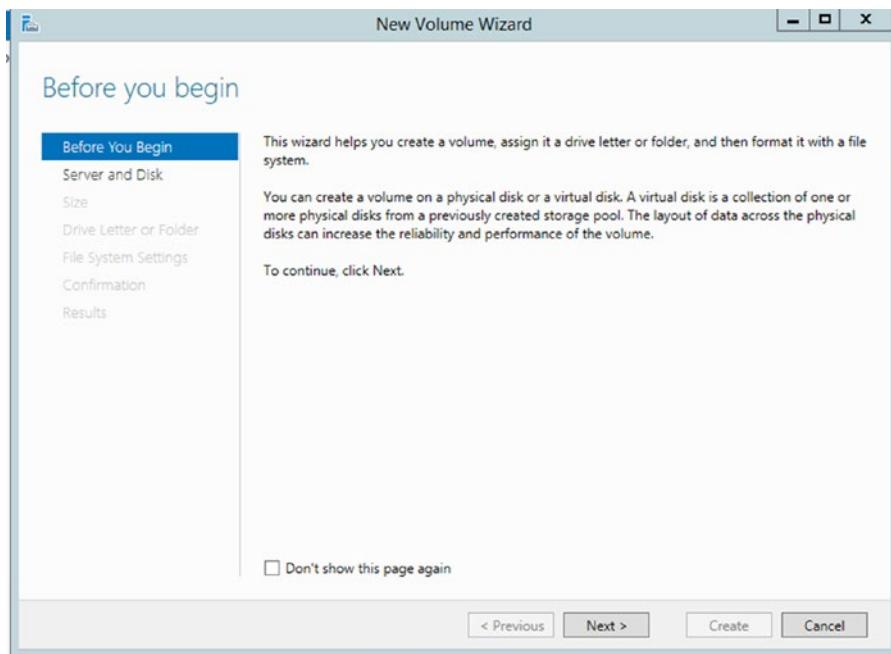


Figure 2-61. New Volume Wizard

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

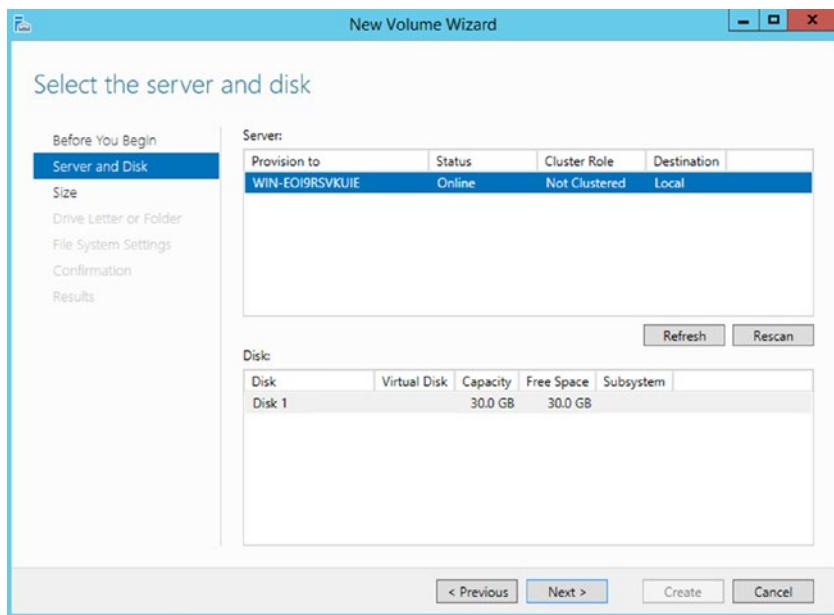


Figure 2-62. Server and disk

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

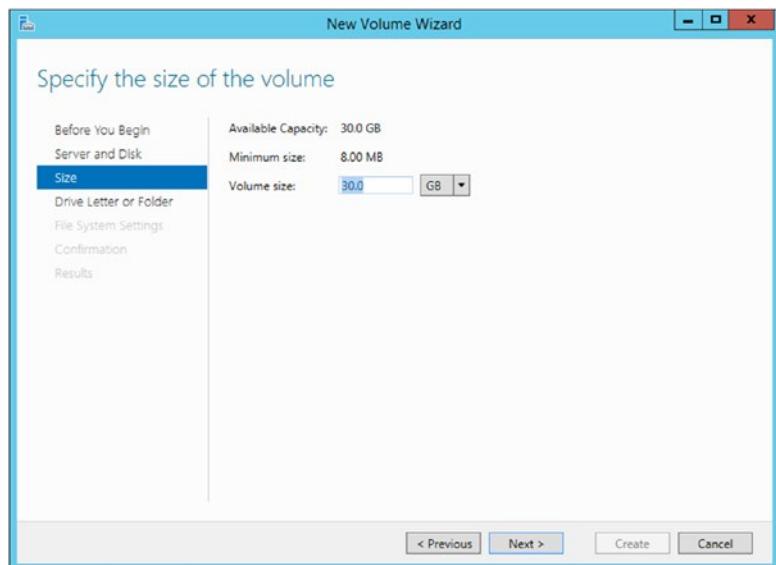


Figure 2-63. Specifying size

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

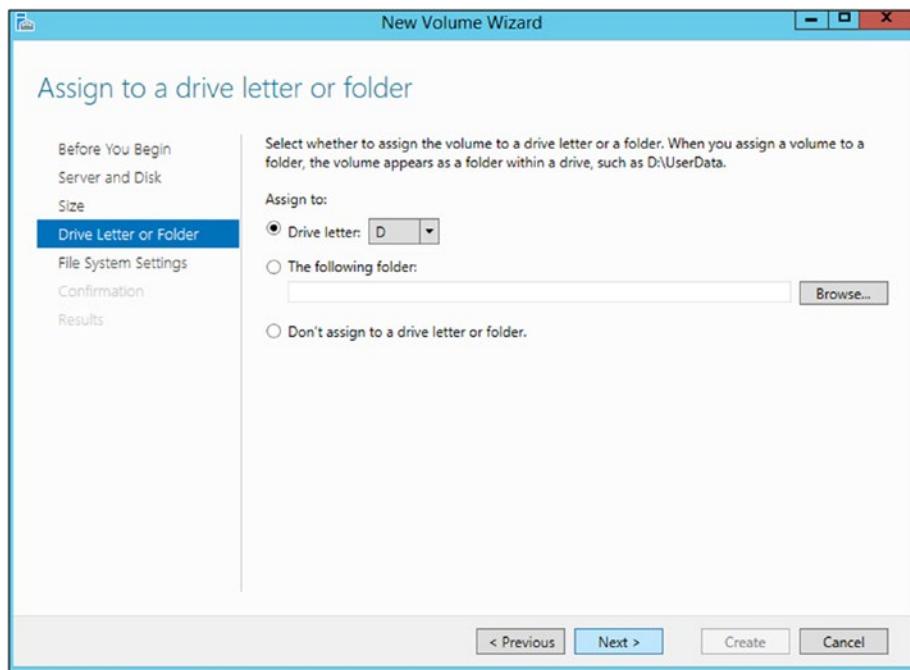


Figure 2-64. Drive letter

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

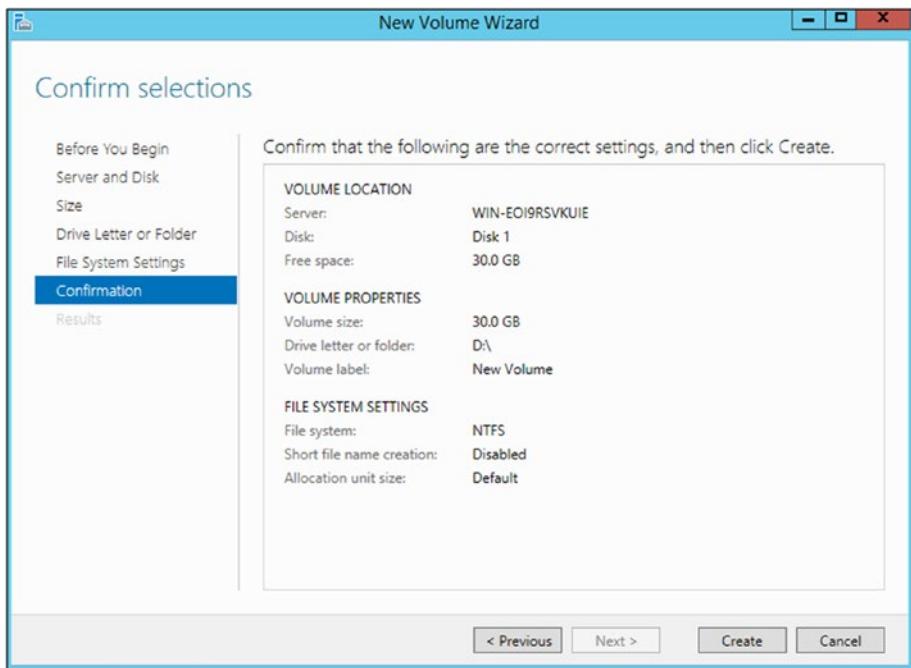


Figure 2-65. Confirmation

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).

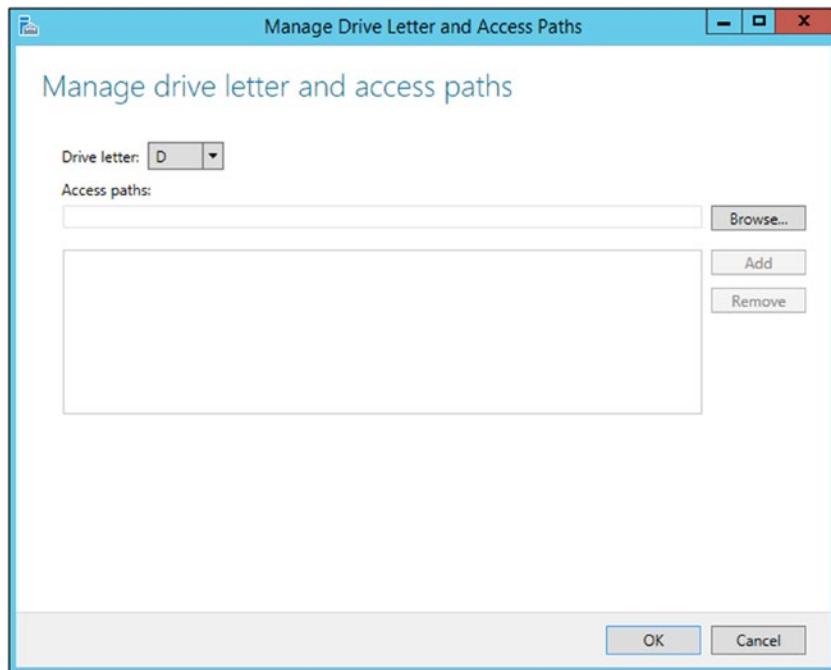


Figure 2-67. Manage drive letter

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

VOLUMES							
All volumes 3 total							
Volume	Status	File System	Label	Provisioning	Capacity	Free Space	Deduplication Rate
WIN-EOI9RSVKUIE (3) \\?\Volume\f2990d62-c5f1-11e6-80b6-806e6f6e6963	Boot	Fixed		350 MB	72.3 MB		
C:	System	Fixed		26.7 GB	16.5 GB		
D:	D	Fixed		29.9 GB	29.8 GB		

Last refreshed on 12/19/2016 2:29:35 PM

Figure 2-68. Volume

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

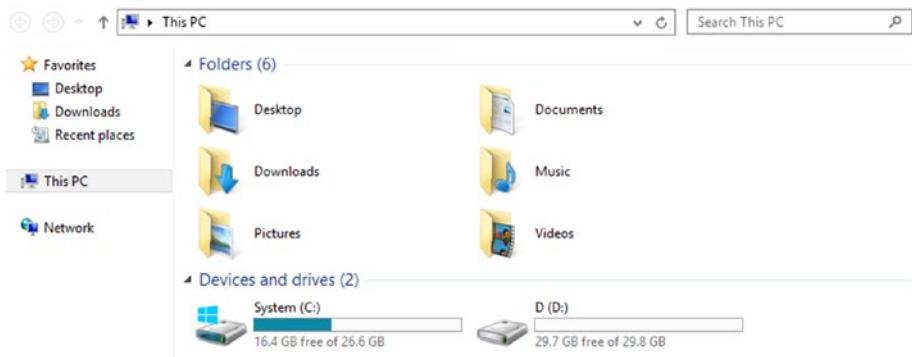


Figure 2-69. Computers

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

The screenshot shows a 'Create Security Rule' dialog box. At the top, there is a note: '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.](#)' Below this, there are several input fields and dropdown menus:

- Name:** A text input field with a required indicator (*).
- Status:** A dropdown menu set to 'Enabled'.
- Security Application:** A dropdown menu set to 'all'.
- Source:** A radio button group where 'Security List' is selected. A dropdown menu shows 'default'.
- Destination:** A radio button group where 'Security List' is selected. A dropdown menu shows 'default'.
- Description:** An empty text input field.

At the bottom right are 'Create' and 'Cancel' buttons.

Figure 2-71. Create Security Rule

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

The screenshot shows the Compute interface with the 'Compute' tab selected. Under the 'Security' section, 'Security Lists' is highlighted. A summary table shows 1 security list and 1 used. The table details a single entry named 'default' associated with instance 'OL_6_4_UENR3_x06_64_201612090...' with Inbound Policy 'Deny' and Outbound Policy 'Permit'. There are buttons for 'Create Security List' and a delete icon.

Name	Associated Instances	Security Rules	Inbound Policy	Outbound Policy
default	OL_6_4_UENR3_x06_64_201612090...		Deny	Permit

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.

The dialog box is titled 'Update Security List'. It contains fields for 'Name' (set to 'default'), 'Inbound Policy' (set to 'Deny (Drop packets, no reply)'), 'Outbound Policy' (set to 'Permit (Allow packets)'), and a 'Description' field which is empty. At the bottom are 'Update' and 'Cancel' buttons.

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).

The screenshot shows the Compute dashboard with the 'Compute' tab selected. In the 'Security' section, 'Security Applications' is highlighted. A summary box displays '28 security applications' and '28 public'. Below this, a table lists various security applications with their names, port types, and port ranges:

Name	Port Type	Port Range / ICMP Type
all	all	
cloudservice	tcp	5020
dns-tcp	tcp	53
dns-udp	udp	53
http	tcp	80
https	tcp	443
icmp	icmp	All
ldap	tcp	389

Figure 2-74. Summary

- 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.

The dialog box is titled 'Create Security Application'. It contains fields for entering application details:

- Name:** A required field indicated by a red asterisk (*).
- Port Type:** A dropdown menu set to 'TCP'.
- Port Range Start:** An input field.
- Port Range End:** An input field.
- Description:** A text input field.

At the bottom right are 'Create' and 'Cancel' buttons.

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.

Name	IP List	Security Rules
instance	10.2.0.0/26, 10.196.160.0/19, 10.196.192.0/19	
pass-info	10.102.201.132, 10.102.201.133, 10.102.201.134, 10.102.20	
public-internet	0.0.0.0/0	
site	10.107.91.0/26, 10.107.91.64/26, 10.107.91.128/26	

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

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	<input type="text"/>
?	* IP List	<input type="text"/>
Description <input type="text"/>		
		<input type="button" value="Create"/> <input type="button" value="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).

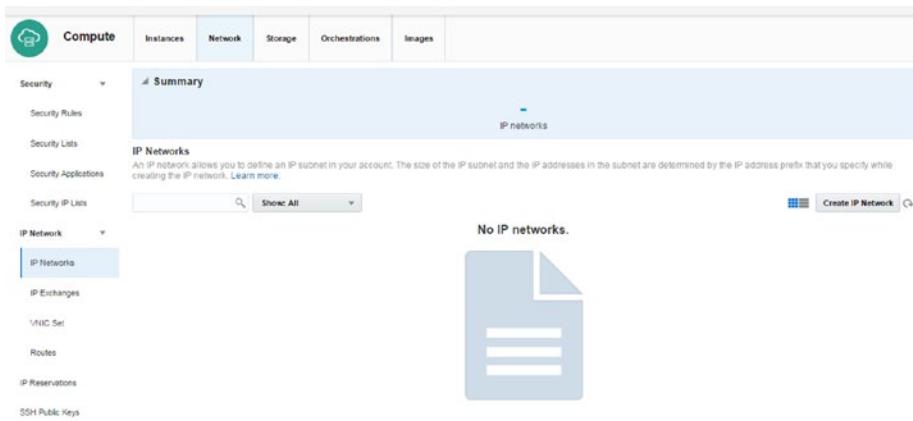


Figure 2-78. IP Networks

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).

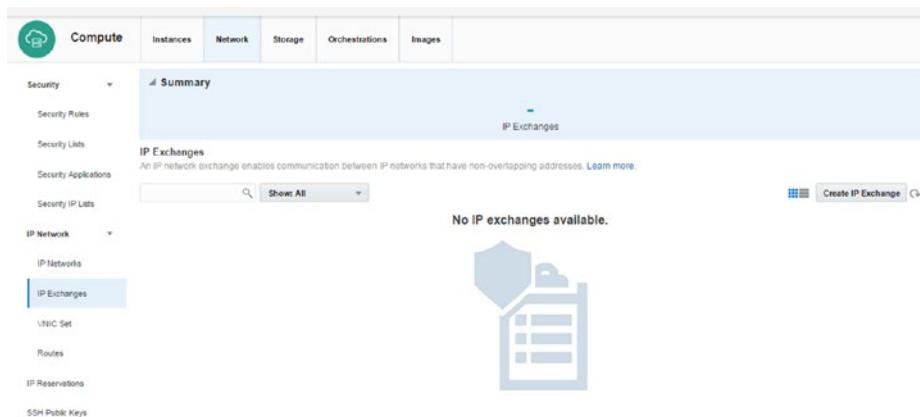


Figure 2-79. IP Exchanges

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).

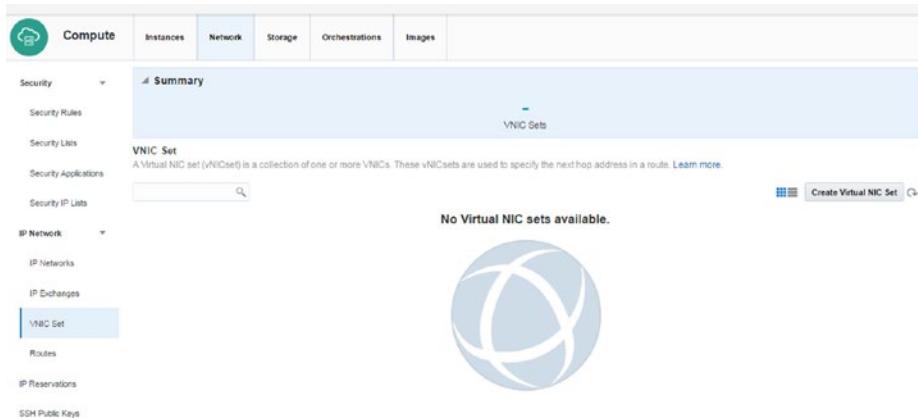


Figure 2-81. VNIC Set

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

The dialog box is titled 'Create Virtual NIC Set'. It contains a field labeled 'Name' with a question mark icon and a required indicator (*). Below it is a list box labeled 'VNIC List' with a question mark icon and a required indicator (*). At the bottom right are two buttons: 'Create' and 'Cancel'.

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).

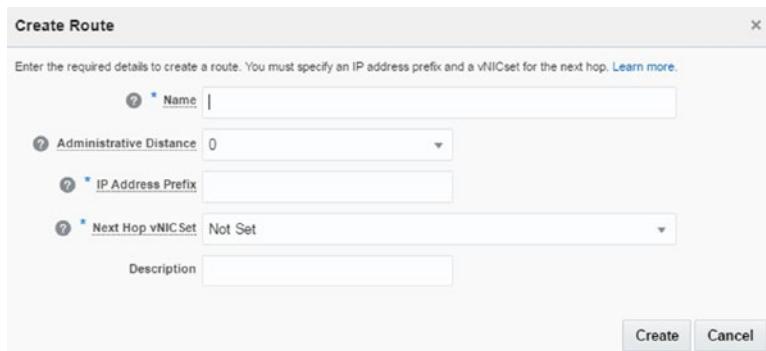


Figure 2-83. Create Route

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).

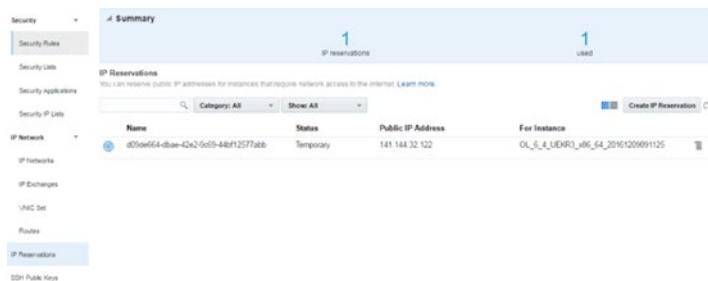


Figure 2-84. IP reservation

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

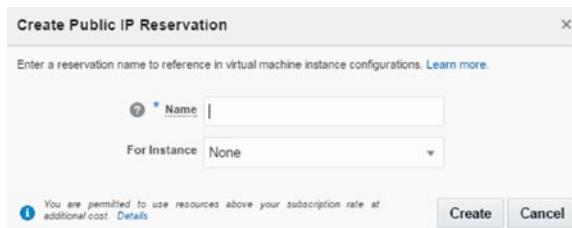


Figure 2-85. Create Public IP Reservation

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.

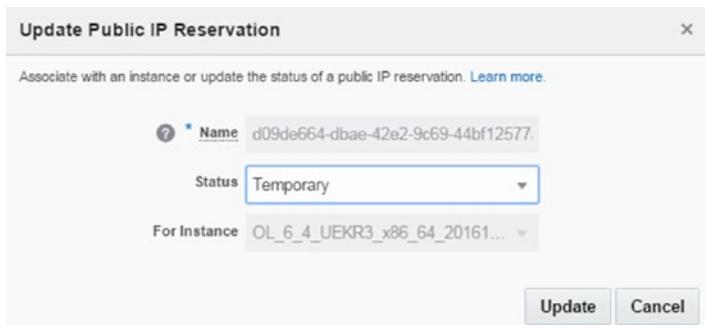


Figure 2-86. Updating IP reservation

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

The screenshot shows the Compute dashboard with the "Compute" tab selected. On the left, a sidebar lists various services: Security, Security Rules, Security Lists, Security Applications, Security IP Lists, IP Network, IP Networks, IP Exchanges, VPC Set, Roles, IP Reservations, and SSH Public Keys (which is currently selected and highlighted in blue). The main area is titled "Summary" and shows statistics for SSH keys: 1 key, 1 enabled, and 1 used. Below this, a section for "SSH Public Keys" is shown with the note: "You can use SSH keys to enable secure access to instances. Learn more." A table lists the key details:

Name	Status	Key Value	Instance
123	Enabled	ssh-rsa AAAAB3NzaC1y2EAAAQJQAAQGExQmIV...	OL_6_4_UERK3_x86_64_20161209091125

A "Add SSH Public Key" button is located at the bottom right of the table.

Figure 2-87. SSH public keys

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

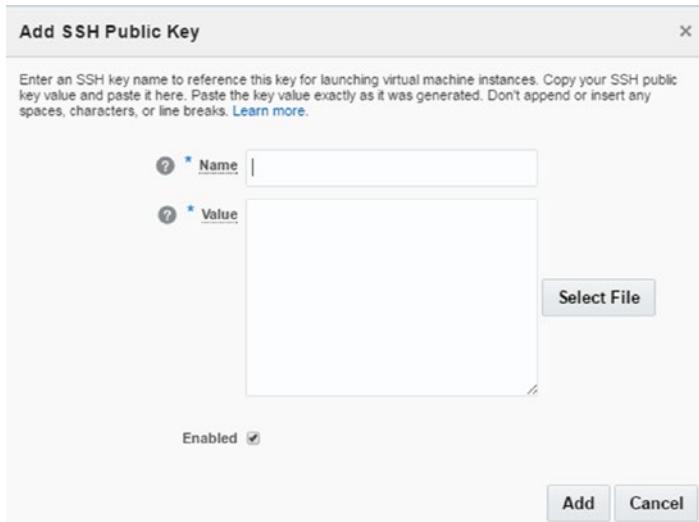


Figure 2-88. Adding an SSH public key

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



Figure 2-89. Viewing the public key

Storage

- 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).

The screenshot shows the Oracle Cloud Compute interface. The top navigation bar has tabs for Compute, Instances, Network, Storage, Orchestration, and Images. The Storage tab is selected. Below the navigation bar, there are three main sections: Storage Volumes, Storage Snapshots, and Snapshot Schedules. The Storage Volumes section is active, displaying a summary table with 1 volume, 0 restored, 4 GB volume size in use, and 4 GB total volume size. A detailed table below lists the volume with Name: OL_6_4_UER01_v66_64_20, Restored From: None, Status: Online, Size: 4 GB, Snapshots: 0, and Attached To: OL_6_4_UER01_v66_64_20. There is also a 'Create Storage Volume' button.

Figure 2-90. Storage volumes

- 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.

The screenshot shows the 'Create Storage Volume' dialog box. It has fields for Name (with placeholder 'Name'), Boot Image (set to 'None'), Size (set to '1 GB'), Storage Property (set to 'storage/default'), and a large empty Description field. At the bottom, there is a note about using resources above subscription limits, a 'Create' button, and a 'Cancel' button.

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).

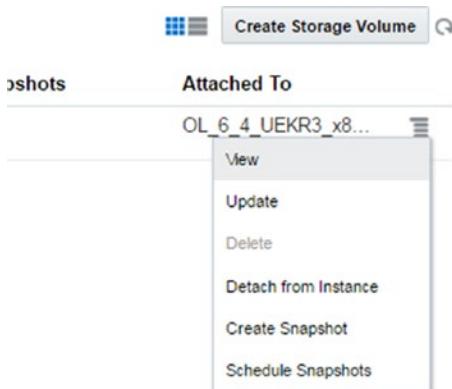


Figure 2-92. Creating storage volumes

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.

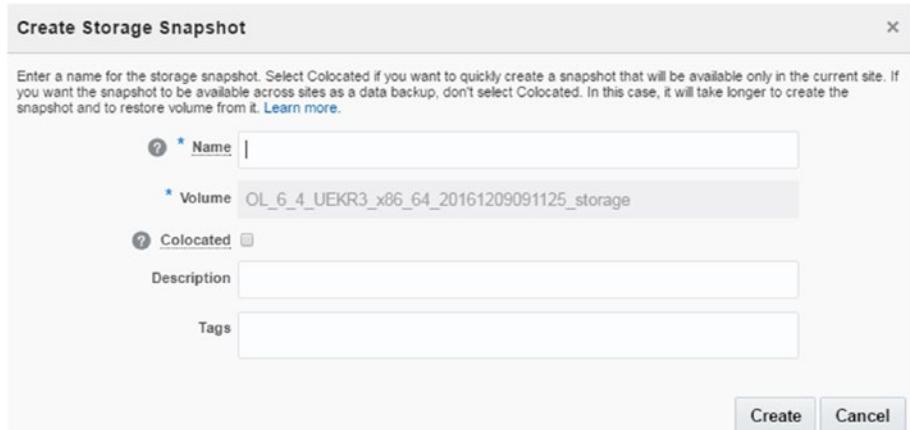


Figure 2-93. Create Storage Snapshot

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.

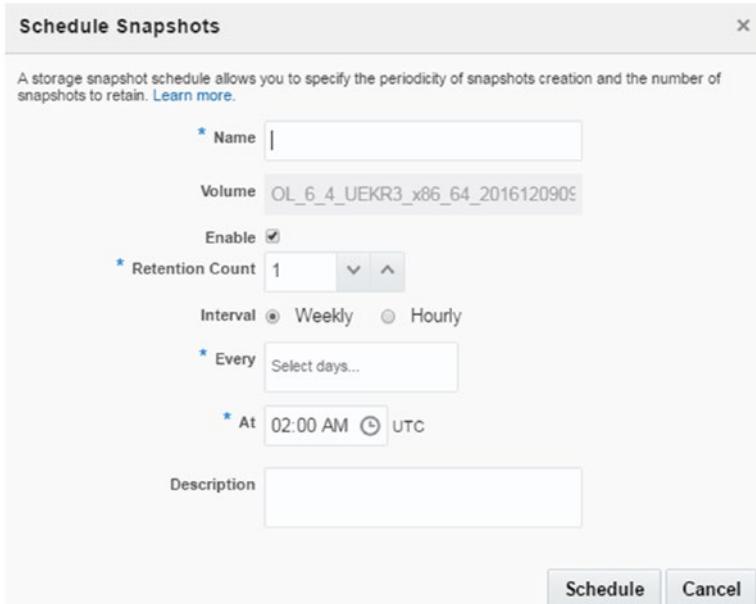


Figure 2-94. Schedule Snapshots

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

The screenshot shows the storage volume details for volume OL_6_4_UERK3_x86_64_20161209091125_storage. Key sections include:

- Information:**
 - Name: /Compute-trconsult1/yasnygl@yandex.com/OL_6_4_UERK3_x86_64_20161209091125_storage
 - Description:
 - Property: storage/default
 - Size: 4 GB
 - Status: Online
 - Bootable: true
- Attached to Instance:**

Name	Status	OCpus	Memory	Disk #	Tags
OL_6_4_UERK3_x86_64_20161...	Running	1	7.5 GB	1	/Compute-trconsult1/yasnygl@yandex.com/OL_6_4_UERK3_x86_64_2...
- Storage Snapshots:** No snapshot created from this volume. Create Storage Snapshot button.
- Backup Configurations:** No backup configuration created for this volume. Create Backup Schedule button.

Figure 2-95. Storage volumes

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

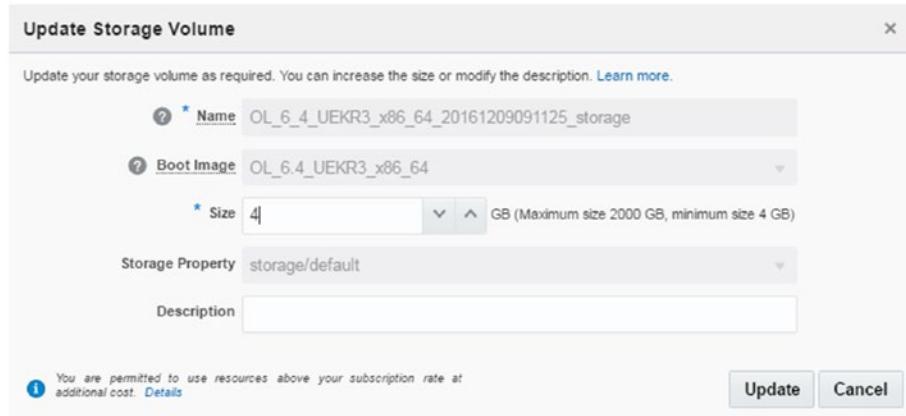


Figure 2-96. Update Storage Volume

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.

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

Name	Description	Status	Time
OL_6_4_UEKR3_x86_64_20161209091125...		Ready	Dec 9, 2016 9:19:32 AM
OL_6_4_UEKR3_x86_64_20161209091125...		Ready	Dec 9, 2016 9:19:02 AM
OL_6_4_UEKR3_x86_64_20161209091125...		Ready	Dec 9, 2016 9:19:04 AM

Figure 2-97. Orchestration

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

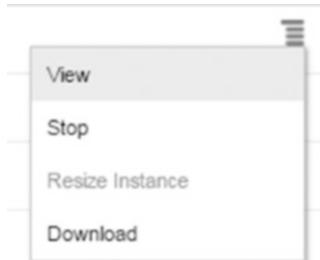


Figure 2-98. Orchestration options

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

The screenshot shows the Oracle Cloud Compute service interface. The top navigation bar includes Compute, Instances, Network, Storage, Orchestrations, and Images. The current view is on the Orchestrations tab. Below the tabs, the URL is shown as `Orchestrations / OL_6_4_UEXR3_x86_64_20161209091125_instance`. The main content area has two sections: **Information** and **JSON**.

Information section details:

- Name: /Compute-tconsult1/yandex@yandex.com/OL_6_4_UEXR3_x86_64_20161209091125_instance
- Description:
- Status: Ready
- Start Time: Dec 9, 2016 9:19:32 AM

JSON section content:

```
{
  "relationships": [],
  "id": "OL_6_4_UEXR3_x86_64_20161209091125",
  "account": "/Compute-tconsult1/default",
  "description": "",
  "schedule": {
    "start_time": "2016-12-09T07:19:32Z",
    "stop_time": null
  },
  "uri": "https://api-z18.compute.ukd2.oracelcloud.com/orchestration/Compute-tconsult1/yandex@yandex.com/OL_6_4_UEXR3_x86_64_20161209091125_instance",
  "options": [
    {
      "status": "ready",
      "info": {
        "memory": 0
      }
    }
  ]
}
```

A **Download** button is located at the top right of the JSON section.

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).

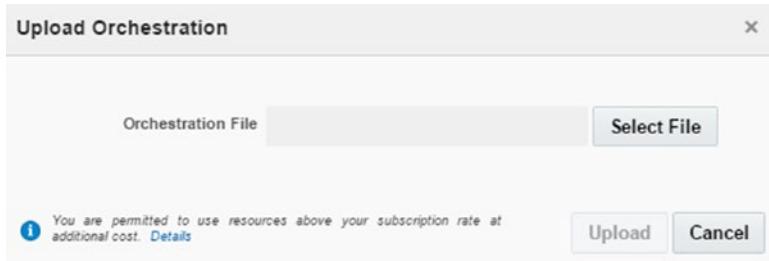


Figure 2-100. Upload Orchestration

- 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.

- 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.

- `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`.
- First, shut down your VM to convert the image.
- VDI must be converted with the following command:

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

- 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
```

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

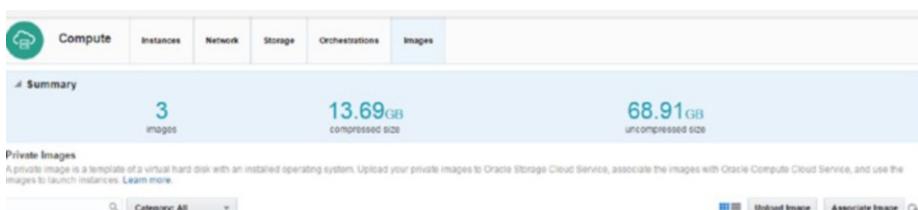


Figure 2-102. Private Images

- Click Upload Image (Figure 2-103).



Figure 2-103. Upload Image

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

The screenshot shows a modal dialog titled "Enter Your Password". It contains instructions: "The page for uploading images will open in a new browser tab. For security, enter your password again." Below this are three input fields: "Identity Domain" with the value "trcompiledb", "User Name" with the value "yasin@compilelab.com", and a password field labeled "* Password" which is currently empty. A "Continue" button is located at the bottom right of the dialog.

Figure 2-104. Password

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

The screenshot shows the "Upload Image" section of the Oracle Compute Cloud Service interface. It includes a "Compute" icon and title. Below it is a detailed description of the upload process: "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." There are input fields for "Image File" (with a "Select a tar.gz file" placeholder and a "Browse" button) and "Target Object" (set to "/compute_images/"). An "Upload" button is located at the bottom left.

Figure 2-105. Upload Image

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

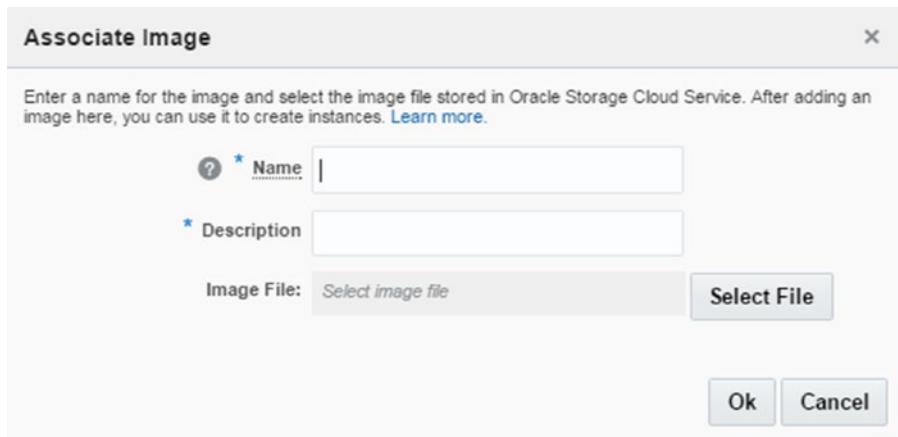


Figure 2-106. Associate Image

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).

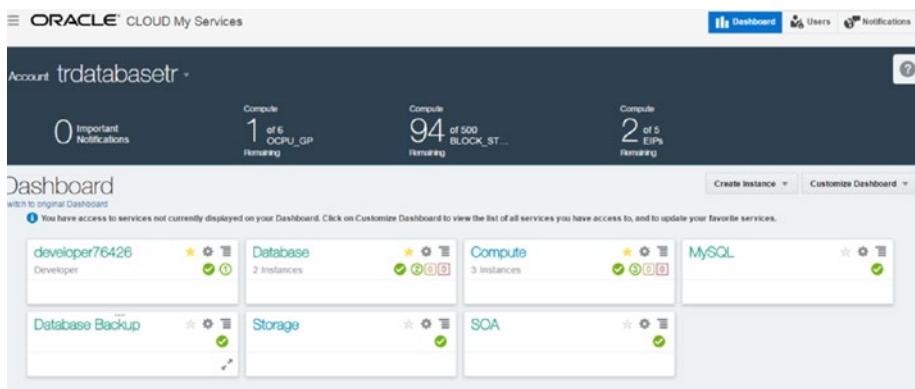


Figure 2-107. Cloud dashboard

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

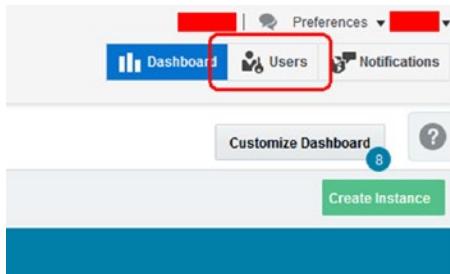


Figure 2-108. Users button

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

A screenshot of the 'Users' section in a cloud management interface. The title bar says 'Users' and includes a status message: 'Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)'. Below the title are tabs for 'Users', 'SFTP Users', 'Roles', 'Custom Roles', 'Contacts', 'SSO Configuration', 'OAuth Administration', and 'My Profile'. The 'Users' tab is selected. A sub-header 'Users' with the sub-instruction 'Manage user accounts, assign roles, and reset passwords.' is present. On the left is a search bar with 'Find user' and a magnifying glass icon. To its right are buttons for 'Add', 'Import', and 'Export'. The main area displays a single user entry: 'Yasin Saygili' with an orange profile icon, 'Email: yasins@linkplus.com.tr', and 'User Name: yasins@linkplus.com.tr'. There is also a small 'Edit' icon next to the user name.

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).

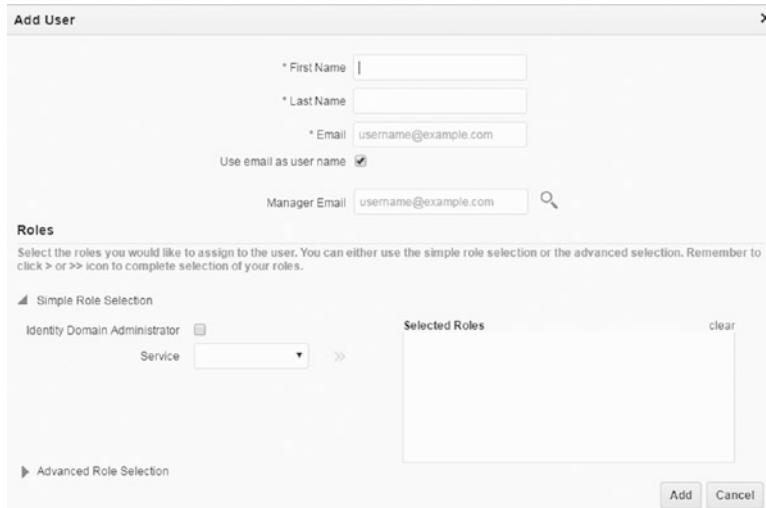


Figure 2-110. Add User

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.

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

User	Email	User Name
em255255 em255255	em255255@csfporacle.com	em255255
em287777 em287777	em287777@csfporacle.com	em287777

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.

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

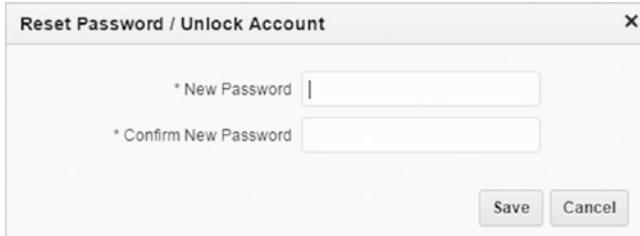


Figure 2-112. Reset Password

- 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).

A screenshot of the Oracle Cloud "Roles" page under the "Users" section. The page title is "Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)". Below the title, there are tabs for "Users", "SFTP Users", "Roles" (which is selected), "Custom Roles", "Contacts", "SSO Configuration", "OAuth Administration", and "My Profile". The main content area is titled "Roles" and contains a sub-header "Manage user assignments to predefined roles created by Oracle Cloud for access to identity domain and services." Below this is a search bar with a magnifying glass icon and a "Find role" input field. At the bottom left, there are navigation links "Page: 1 Previous Next". The main list displays four roles:

Role Name	Description
SOA SOA Administrator	Role Name: SOA.SOA_Administrator Description: Admin Role for administering SOA cloud service Role for service inst...
APAAS APaaS Administrators	Role Name: APAAS.APaaS_S_Administrator Description: Admin Role for administering APaaS Role for service instance APAAS
Compute Compute Monitor	Role Name: Compute.Compute_Monitor Description: Role for service instance Compute
Compute Compute Operations	Role Name: Compute.Compute_Operations Description: Role for service instance Compute

Figure 2-113. Role

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

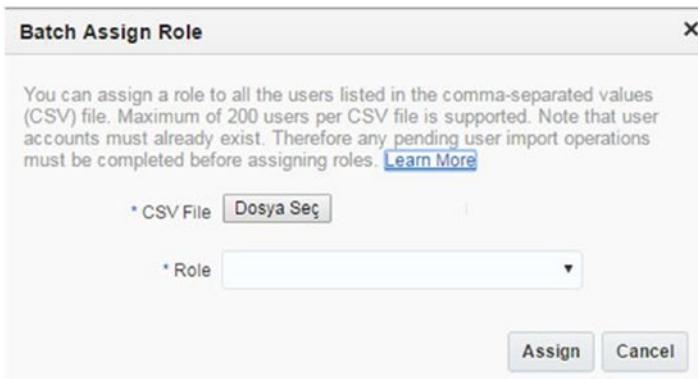


Figure 2-114. Assigning a role

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

The screenshot shows the "Custom Roles" section of a user interface. It includes a "Find role" search bar, a "No roles available" message, and an "Add" button. The "Custom Roles" tab is selected in the navigation bar.

Figure 2-115. Custom Role

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

The screenshot shows a modal dialog titled "Add Custom Role". It contains three input fields: "Role Name", "Display Name", and "Description". At the bottom are "Add" and "Cancel" buttons.

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).

The screenshot shows the 'Users' tab selected in the top navigation bar, with the sub-tab 'Contacts' highlighted. The page title is 'Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)'. Below the tabs, there is a search bar labeled 'Find Contact' and a button with a magnifying glass icon. To the right of the search bar is a dropdown menu labeled 'Notification Contacts'. In the center, there is a large blue placeholder icon of a person, and below it, the text 'No contacts available'.

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).

The dialog box has a title bar 'Add Notification Contact' with a close button 'X'. Inside, there are three input fields: 'Email' containing 'username@example.com', 'Phone Number' (empty), and 'Services' (empty dropdown). At the bottom are 'Add' and 'Cancel' buttons.

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).

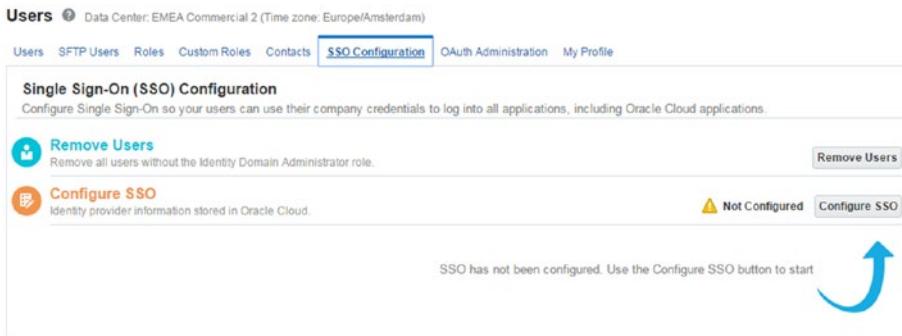


Figure 2-119. SSO configuration

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

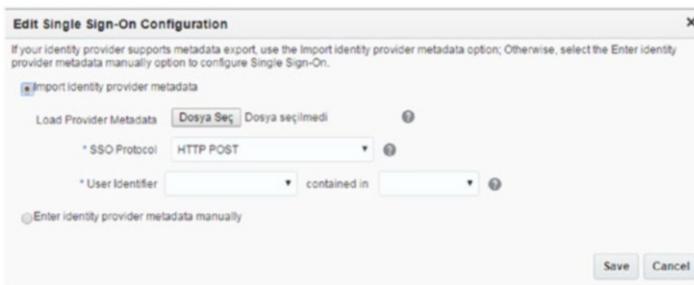


Figure 2-120. SSO configuration

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

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

CHAPTER 2 ■ COMPUTE CLOUD

The screenshot shows the OAuth Administration interface. At the top, there are tabs: Users, SFTP Users, Roles, Custom Roles, Contacts, SSO Configuration, **OAuth Administration**, and My Profile. The OAuth Administration tab is selected. Below the tabs, there's a section titled "OAuth" with the sub-section "Register Resource". It contains a "Find Resource" search bar and a message stating "No resources available.". To the right are "Register" and "Import" buttons. Below this is the "Register Client" section, which also includes a "Find Client" search bar and a message "No clients available.". To the right are "Register" and "Show: All Clients" buttons. The final section is "Manage Certificates", which includes a "Create Key Pair" and "Download" button.

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.)

The screenshot shows the My Profile page. At the top, there are tabs: Users, SFTP Users, Roles, Custom Roles, Contacts, SSO Configuration, OAuth Administration, and **My Profile**. The My Profile tab is selected. Below the tabs, there's a "User Information" section with fields for First Name (Yasin), Last Name (Saygili), and Email (yasin@linkplus.com.tr). A note states: "Note: Identity domain administrators can update First Name, Last Name and Email from the Users tab in My Services; these cannot be updated via My Profile." Below this is the "Change Password" section, which displays the message: "Current password will expire on Tuesday, Jan 17 2017 at 12:59 PM UTC." It contains three input fields: "Old Password", "New Password", and "Confirm New Password". To the right of the "Old Password" field is a "Password Policy" link. At the bottom are "Submit" and "Reset" buttons.

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).

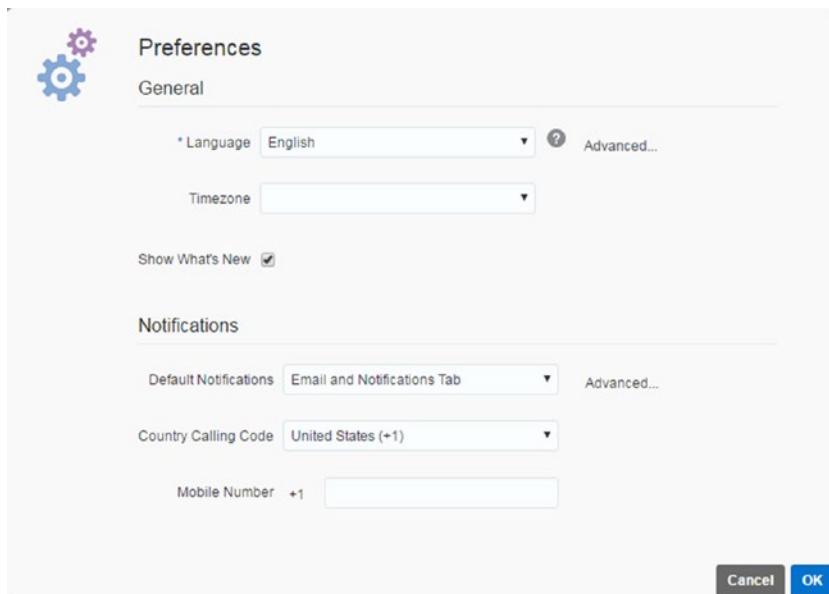


Figure 2-123. Preferences

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).

This screenshot is identical to Figure 2-124, showing the Notifications section. The "Applications" tab is now active. The main content area displays the same message: "No notifications available for the selected search criteria".

Figure 2-125. Application on notification

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

This screenshot is identical to Figures 2-124 and 2-125, showing the Notifications section. The "Platform Services" tab is now active. The main content area displays the same message: "No notifications available for the selected search criteria".

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).

The screenshot shows the 'Notification Preferences' tab selected within the 'Notifications' section of the Oracle Cloud interface. At the top, it displays 'Data Center: EMEA Commercial 2 (Time zone: Europe/Amsterdam)'. Below this, there are tabs for 'All', 'Applications', 'Platform Services', and 'Notification Preferences'. The 'Notification Preferences' tab is active.

General
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 [Input field]
A note below states: 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

Buttons at the top right include 'Reset' and 'Save'.

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).

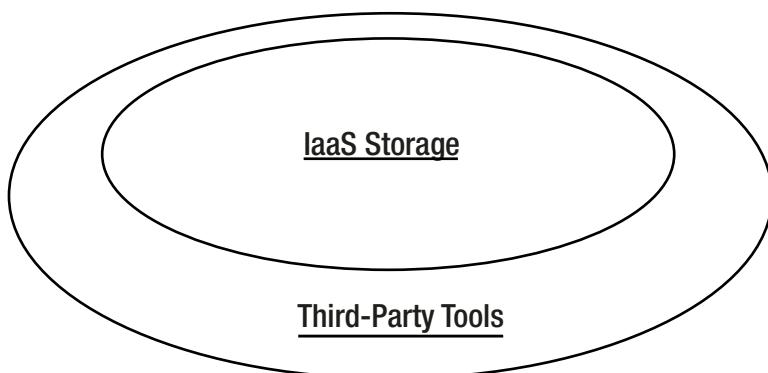


Figure 3-1. IaaS storage and third-party tools relations

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:

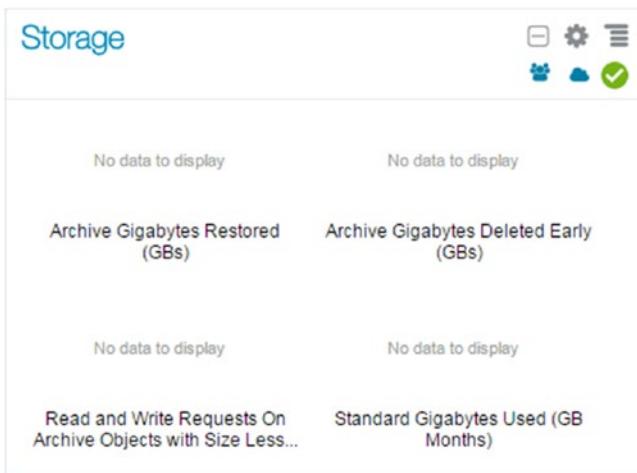
1. *Elasticity*: Provides an elastic approach to storing hardware and configuring disk size. With this feature, your data can increase from megabyte to petabyte.
2. *Standardization*: Manages data via third-party tools, such as Open Stack. Manages object files via REST or other tools.
3. *Security*: 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.

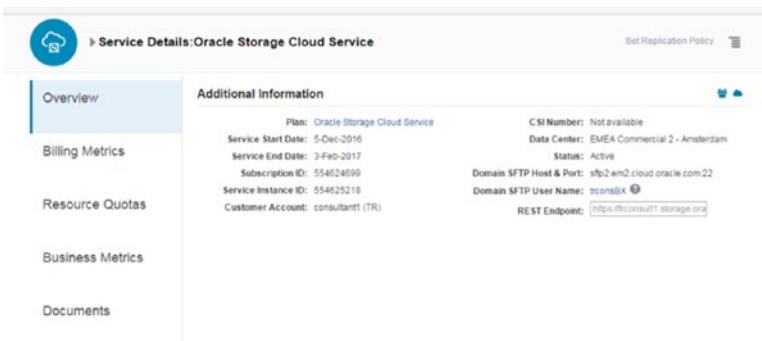
Installation

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).

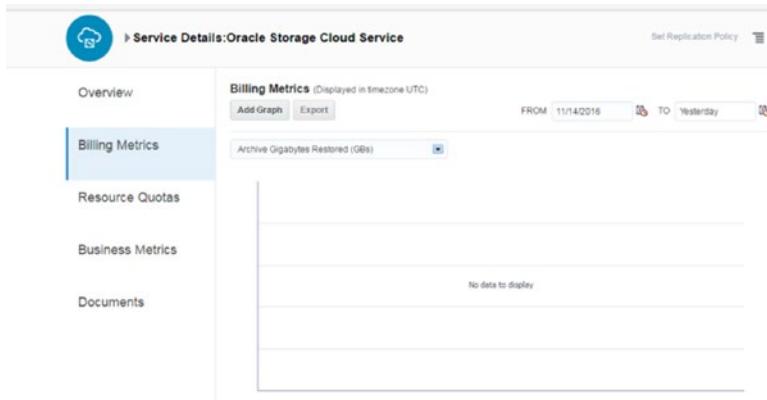


Figure 3-4. Billing Metrics service

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

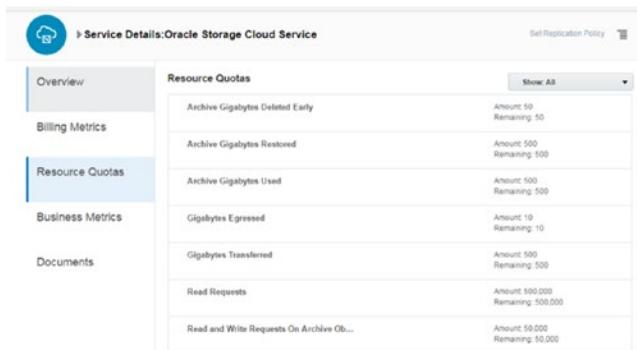


Figure 3-5. Resource Quotas

- Next, download cURL from the following web site: <https://winampplugins.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_nghttp2_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).

The screenshot shows the 'Additional Information' section of the Oracle Storage Cloud Service. It displays various service details:

- Plan:** Oracle Storage Cloud Service
- Service Start Date:** 5-Oct-2016
- Service End Date:** 4-Dec-2016
- Subscription ID:** 545310908
- Service Instance ID:** 545311445
- Customer Account:** thetalent.me (US)
- CSI Number:** Not available
- Data Center:** US Commercial 2
- Version:** 16.1.0.0.0
- Status:** Active
- REST Endpoint:** <https://ustheta1.en.storage.oraclecloud.com>

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.)

The dialog box is titled 'Set Replication Policy'. It contains a list of replication policy options:

- Primary DC: Chicago (us2); Georeplication DC: None
- Primary DC: Ashburn (us6); Georeplication DC: None
- Primary DC: Ashburn (us6); Georeplication DC: Chicago (us2)
- Primary DC: Chicago (us2); Georeplication DC: Ashburn (us6)

A caution message at the bottom left states: 'Caution: Once set, the replication policy cannot be changed for the service instance.' At the bottom right are 'Set' and 'Cancel' buttons.

Figure 3-7. Setting replication policy

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

The dialog box is titled 'Confirm Replication Policy Selection'. It displays the selected replication policy:

You selected Primary DC: Chicago (us2); Georeplication DC: Ashburn (us6) as the replication policy for your service instance.

A note below states: 'Are you sure you want to set this policy? Note that once set, the replication policy cannot be changed for the service instance.'

At the bottom are 'Confirm' and 'Cancel' buttons.

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-usthetalen/test
```

```
D:\curl_7_51_0_openssl_nghttp2_x64>curl -v -s -X GET -H "X-Auth-Token:  
AUTH_tkb2  
4e42debe0154c71d19f69586f25967"  
https://storage.us2.oraclecloud.com/v1/Storage-u  
sthetalen/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-usthetalen/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: usthetalen.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).

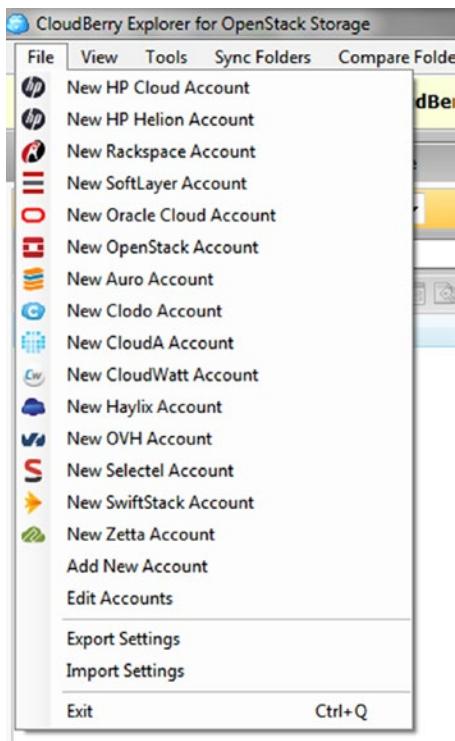


Figure 3-9. Oracle Cloud on CloudBerry

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-usthetalen: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).

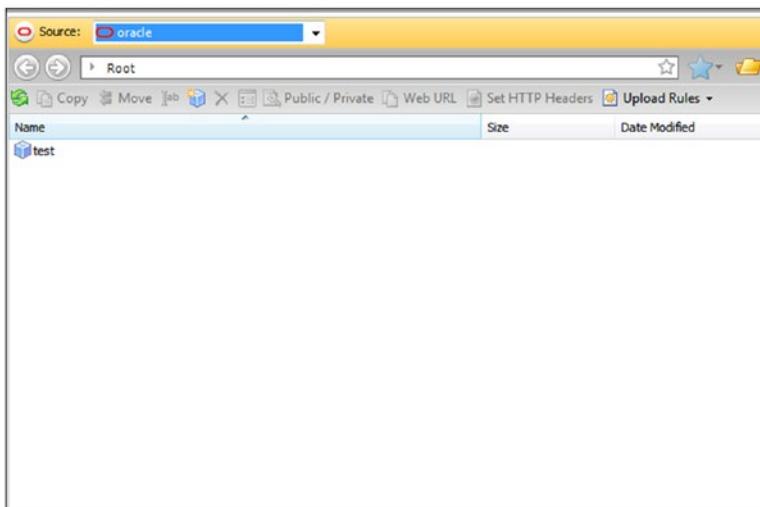


Figure 3-11. Credentials in CloudBerry

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

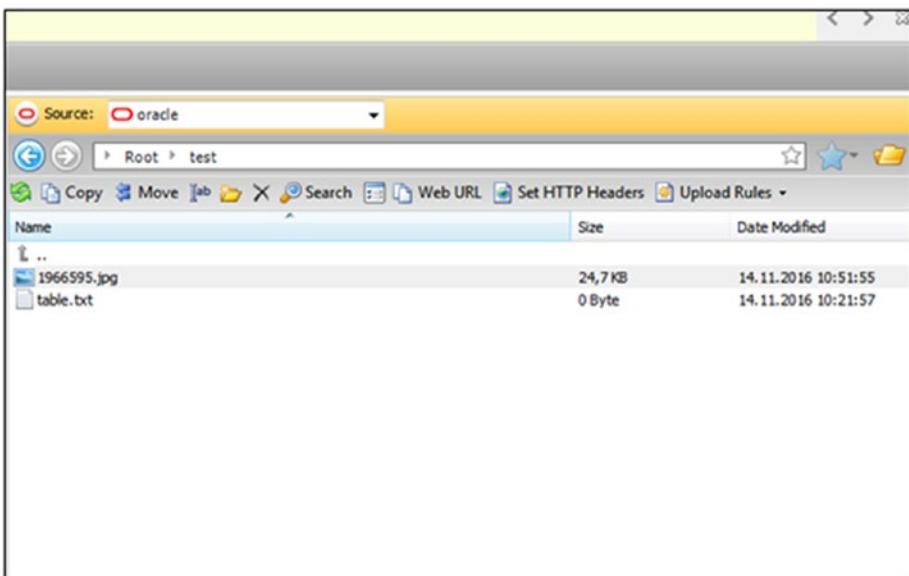


Figure 3-12. CloudBerry

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.

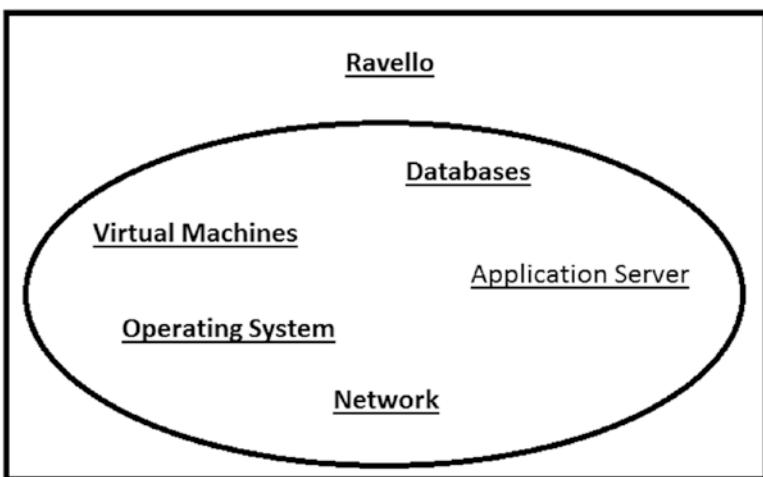


Figure 4-1. Ravello and IT environments

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).

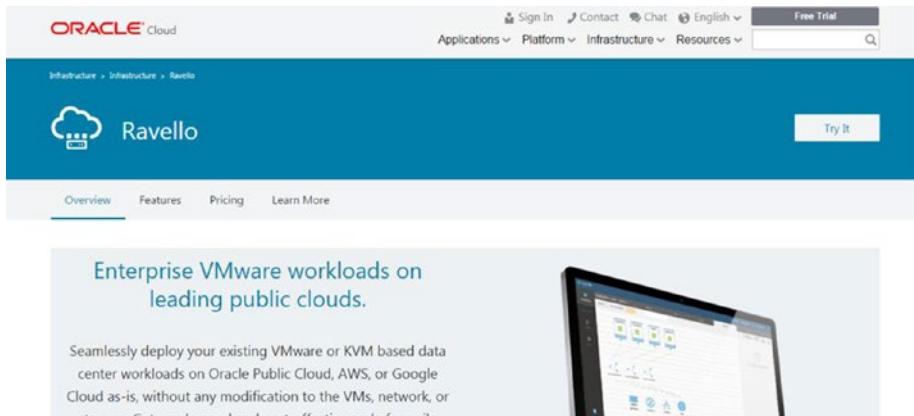


Figure 4-2. Ravello trial

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

A screenshot of the Ravello trial registration form. The form is titled "ORACLE | ravello". It starts with a message "Thanks for trying Ravello." followed by a note that clicking "submit" agrees to the terms of use. Below this are two text input fields for "First Name" and "Last Name". Underneath are two more fields: one containing the email address "yasin@thetalent.me" and another for "Company". At the bottom is a large text area labeled "Use Case" with a scroll bar. A blue "SUBMIT" button is located at the very bottom of the form.

Figure 4-3. Ravello trial form

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

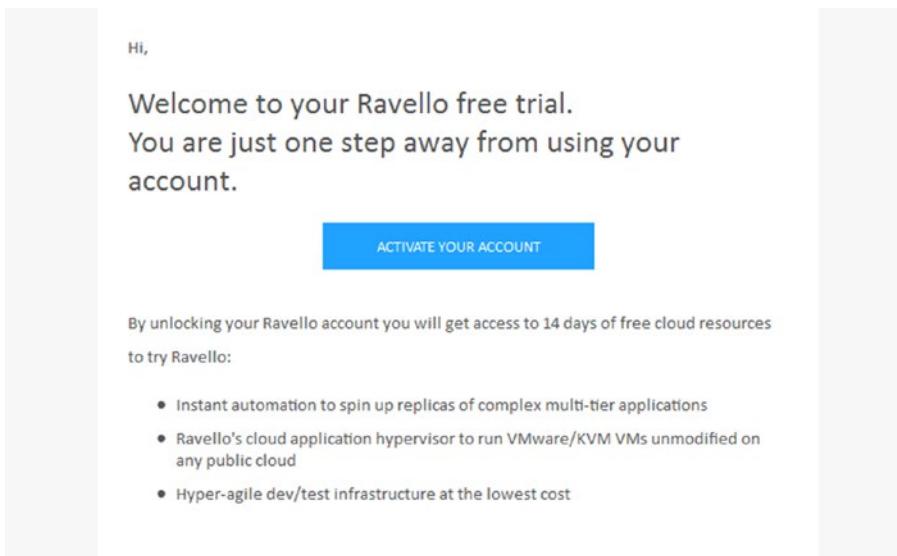


Figure 4-4. Account activation

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

The registration form has a header with the "ORACLE ravello" logo. The first field is a text input labeled "Username" containing "yasiln@linkplus.com.tr". Below it are two smaller fields: "First Name" with "yasil" and "Last Name" which is empty. The next section is "Password Strength" with two fields: "Password" and "Confirm Password", both currently empty. There is a "Phone Number" field below. A note below the phone number field states: "Our trial is intended for good faith users who are keen to understand the Ravello service and evaluate how it may benefit their organizations. To minimize the risk of abuse we request to have your phone number for identification reasons. In case we do need to reach out to you by phone and the number above is not accessible we may decide to lock down your trial account immediately." The next section is "Organization Name" with an empty field. A note below it says: "Company, department or any name. Will be used to add other team members to your organization and collaborate on your applications and blueprints." The final section is "Job Title" with an empty field. At the bottom, there's a question "What are you likely to run on Ravello?" with two radio button options: "Enterprise apps (e.g. SharePoint/Oracle/etc. on VMware)" and "Networking and Security labs".

Figure 4-5. Registration

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

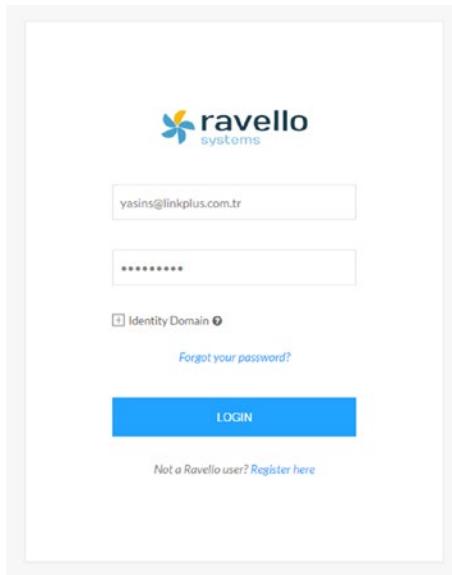


Figure 4-6. Login

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

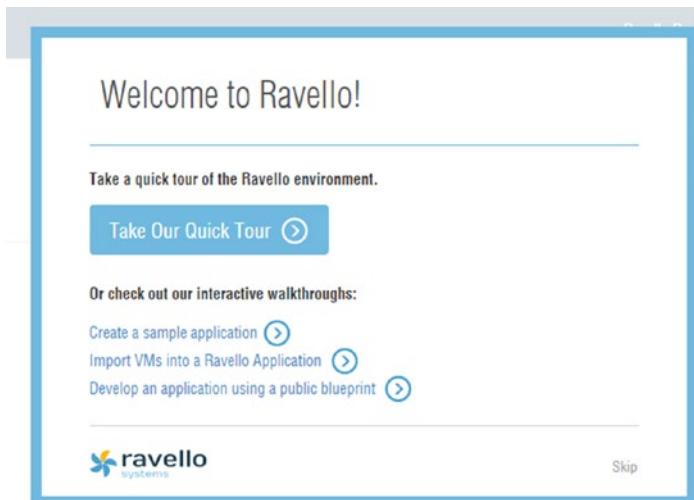


Figure 4-7. Introduction to Ravello

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).

The screenshot shows a modal dialog titled "Create Application". It contains four input fields: "Name" (IaaS-Book), "Description" (IaaS-Book), "Bucket" (Organization), and "From Blueprint" (checked, with "nginx-tomcat6-mysql" selected). At the bottom are "Create" and "Cancel" buttons.

Name	IaaS-Book
Description	IaaS-Book
Bucket	Organization
From Blueprint	<input checked="" type="checkbox"/> nginx-tomcat6-mysql

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).

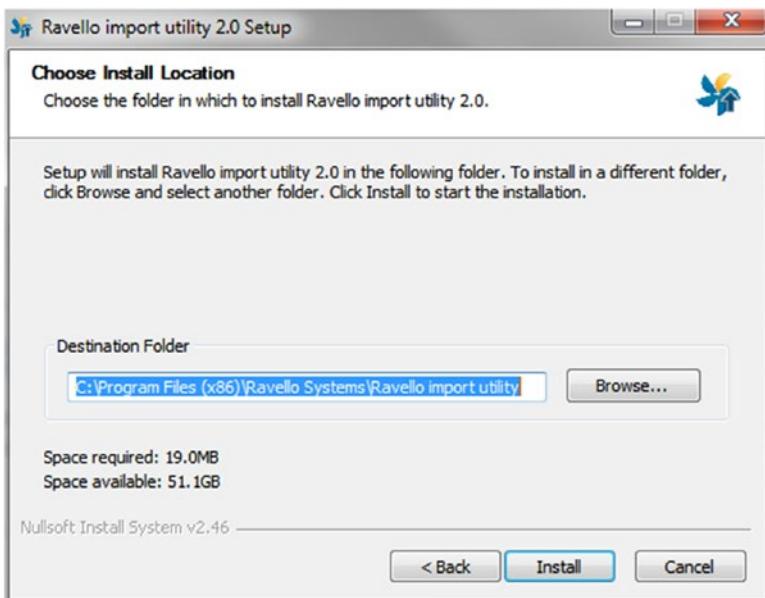


Figure 4-11. Installing a location

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

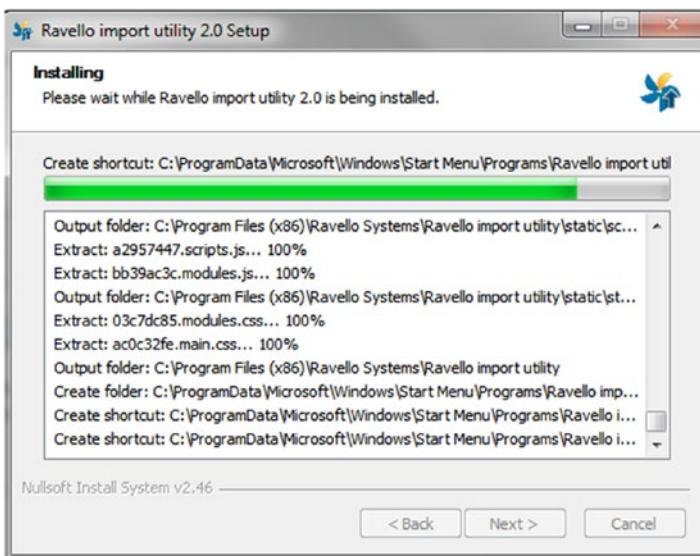


Figure 4-12. Loading bar

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

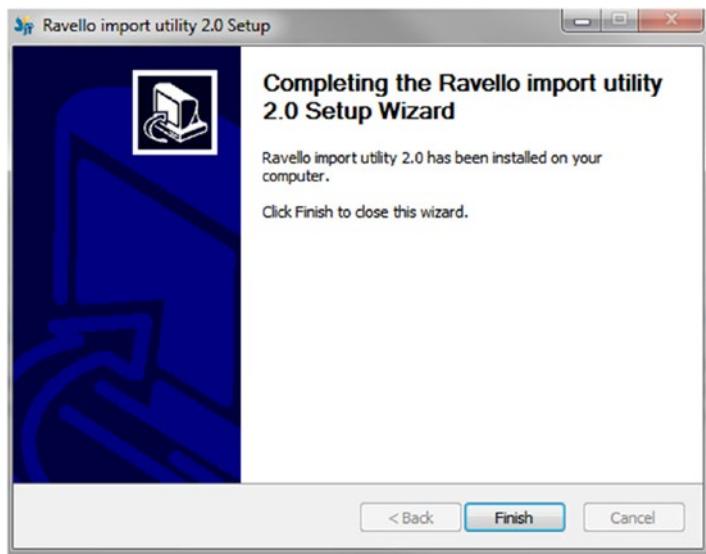


Figure 4-13. Completing the installation

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

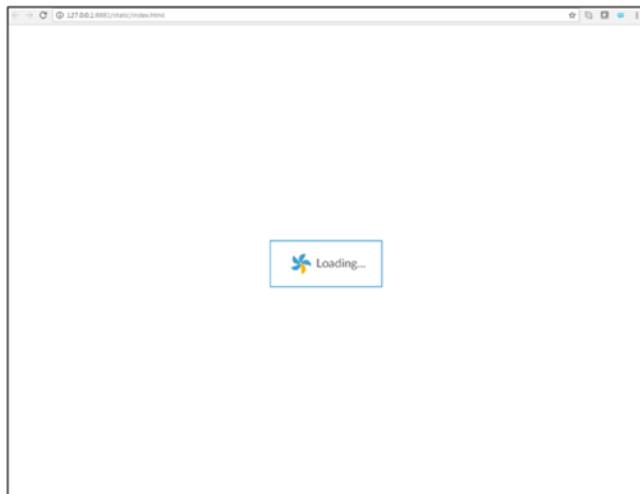


Figure 4-14. Screen

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

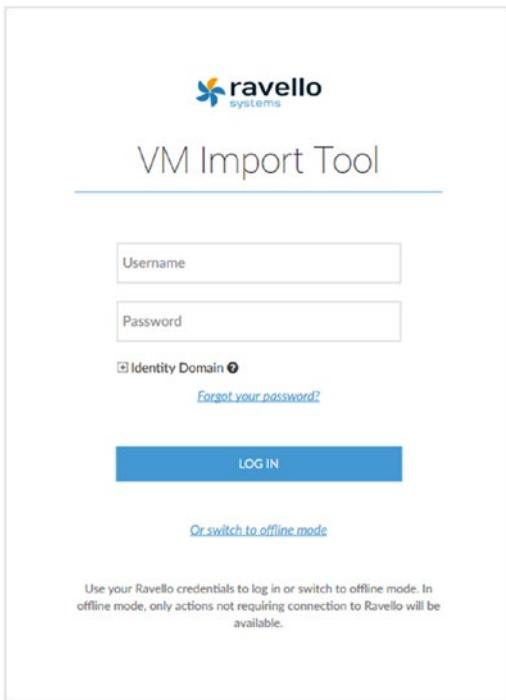


Figure 4-15. Login

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

The screenshot shows the 'Uploads' section of the Ravello dashboard. At the top, there's a header with a '+' icon for 'Upload New Item' and a search bar. Below the header is a table with columns: Name, Progress, Status, Info, and Created. The table has a single row with a blank entry. Above the table are filter options: 'Filter: All', 'Pause', 'Retry', 'Resume', and 'Delete'.

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).

A screenshot of the Oracle Ravello VM Import Tool interface. At the top, it says "ravello systems" and "VM Import Tool". On the right, there are links for "Help & Support" and a user account. The main title is "Upload Your VMs or Disks". Below it, a section titled "SELECT THE SOURCE FOR YOUR VM OR FILE" contains several options:

- "Extract and upload VMs from vCenter, vSphere or ESX (recommended)"
- "Upload a VM from an OVF, OVA or Ravello Export file"
- "Create a VM by uploading existing disk files (ISO, VMDK, QCOW2)"
- "Upload a disk image (ISO, VMDK, QCOW2)"
- "I have another type of file, what do I do?"

A note below the first option reads:

Extract and upload VMs from vCenter, vSphere or ESX (recommended)
If the virtual machine is running on a vCenter, vSphere or ESX, we recommend that you extract it directly from vCenter or vSphere.
To do so, input the location of your vCenter or vSphere and your credentials, then select the VM to export. The process will export the VM and upload it into your account in Ravello. This process has no effect on the source VM.
Note: You can select the "Export only" option and upload the VM later by selecting "Upload a VM from OVF file or Ravello Export file".

At the bottom center is a blue button labeled "START" with a white arrow icon.

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).

The screenshot shows the Ravello 'Uploads' section. At the top, there's a search bar with the placeholder 'Enter name, type or status'. Below it is a table header with columns: 'Name', 'Progress', 'Status', 'Info', and 'Created'. A single row is visible, showing '12c_for_Developers' with a progress bar at 99%, labeled 'Uploading' and '14.2 GB/14.34 GB (2 Mbps)'. The 'Info' column contains the text 'Uploading VM from: 12c_for_Developers.ovf' and a 'More...' link. The 'Created' column shows the date '2/19/17 1:02 PM'. There are also buttons for 'Upload', 'Pause', 'Retry', 'Resume', and 'Delete'.

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).

The screenshot shows the Ravello application management interface. On the left, there's a sidebar with icons for 'Recent App', 'Library', 'Admin', and 'Learn'. The main area is titled 'Applications > IaaS-Book' and shows tabs for 'Canvas', 'Network', 'Log', and 'Data is save'. In the center, there's a 'VMs' section with a button to 'Import VM'. A modal dialog is open, titled '+ Import VM', containing a search bar 'Name' and a list of 'Available VMs (22)'. The list includes '12c_for_Developers', 'Empty ESX', 'Xubuntu Desktop 14...', 'Ubuntu Server 14.0...', and 'Ubuntu Server 14.0...'. Below this is an 'Other' section with a 'Group' item. At the bottom of the dialog are buttons for '+', 'Import', 'Cancel', and 'Import'.

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).

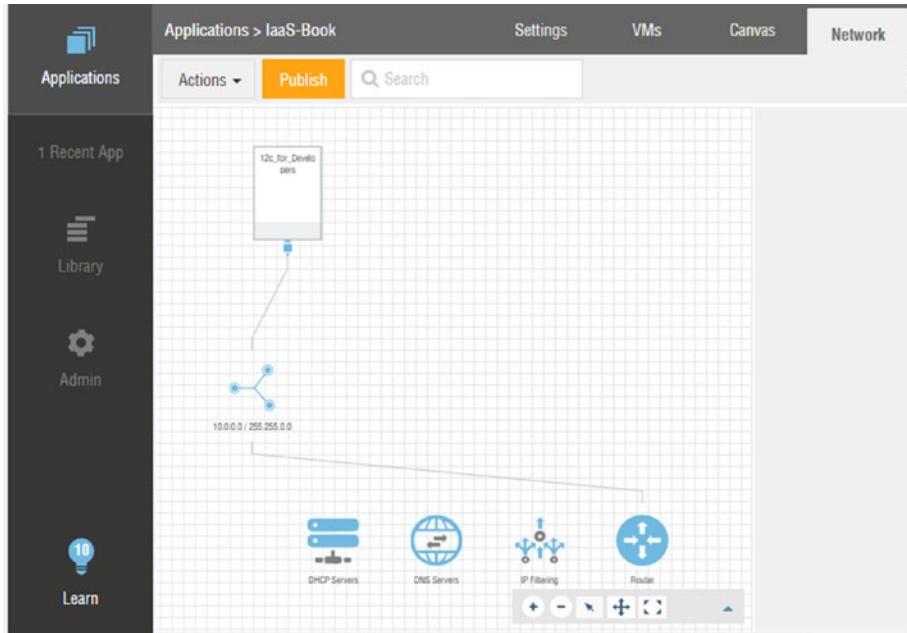


Figure 4-22. Network tab

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 Diskspace. 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).

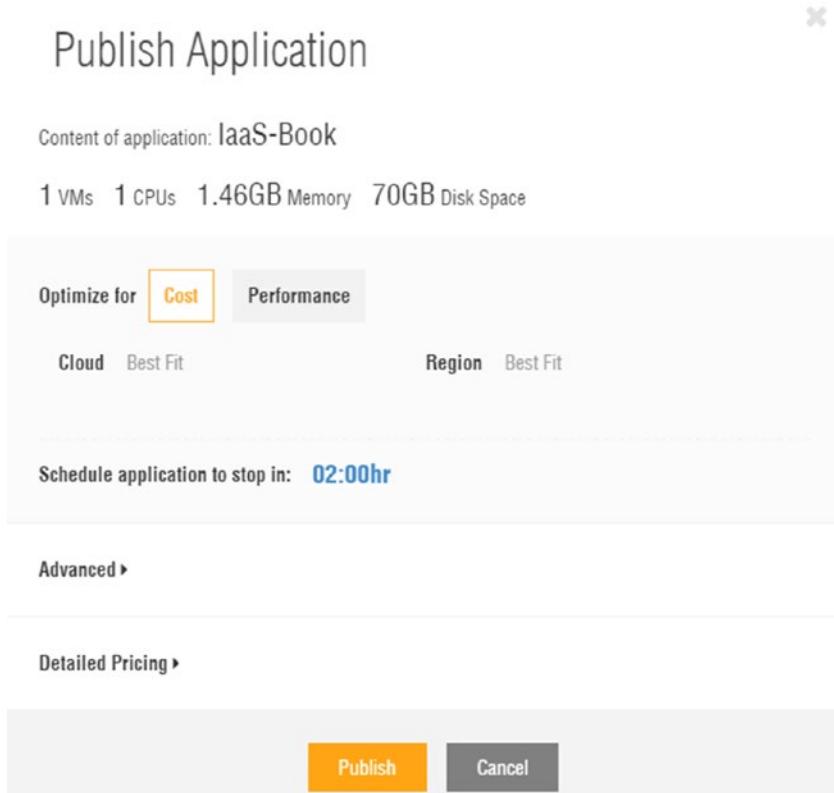


Figure 4-24. Publish Application

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).

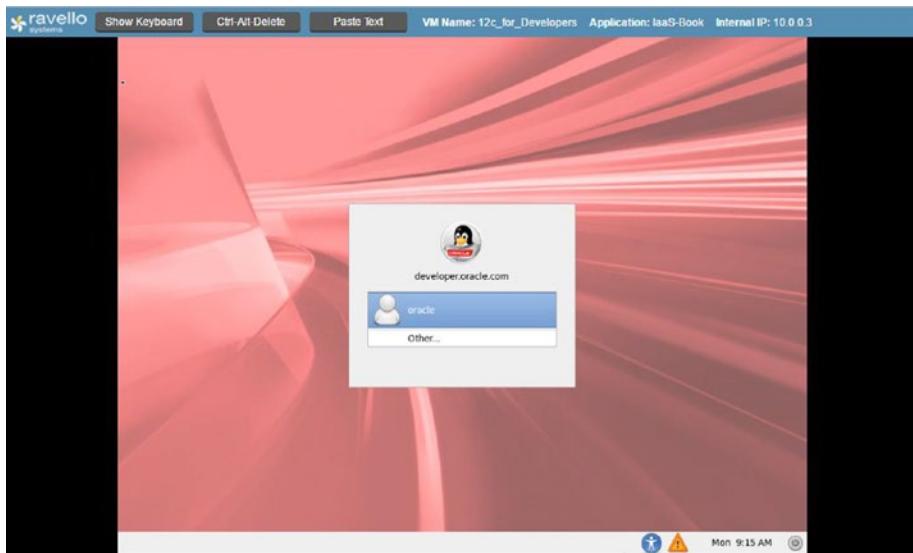


Figure 4-25. Monitor

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 Blueprint 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).

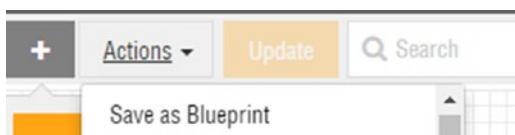


Figure 4-26. Blueprint

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.

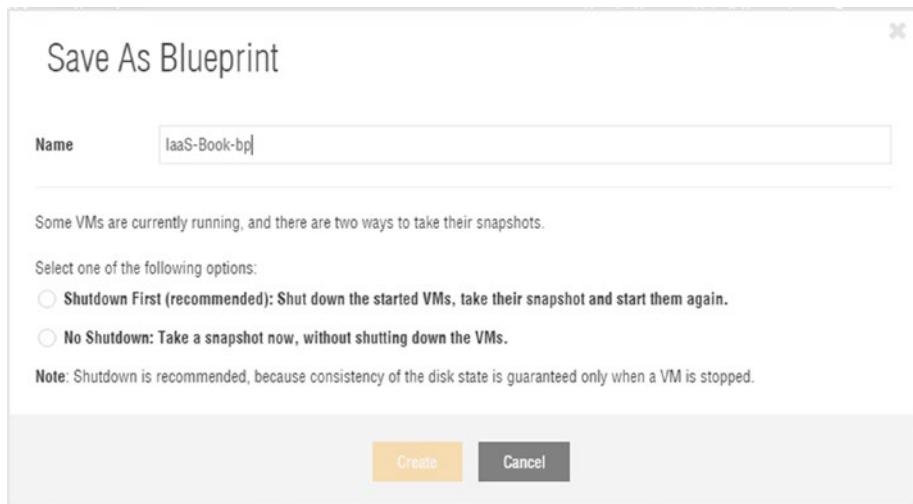


Figure 4-27. Saving as blueprint

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).

Name	Description	Created	Owner
IaaS-Book-bp	IaaS-Book	2/20/17 9:25 AM	yasin saygili

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).

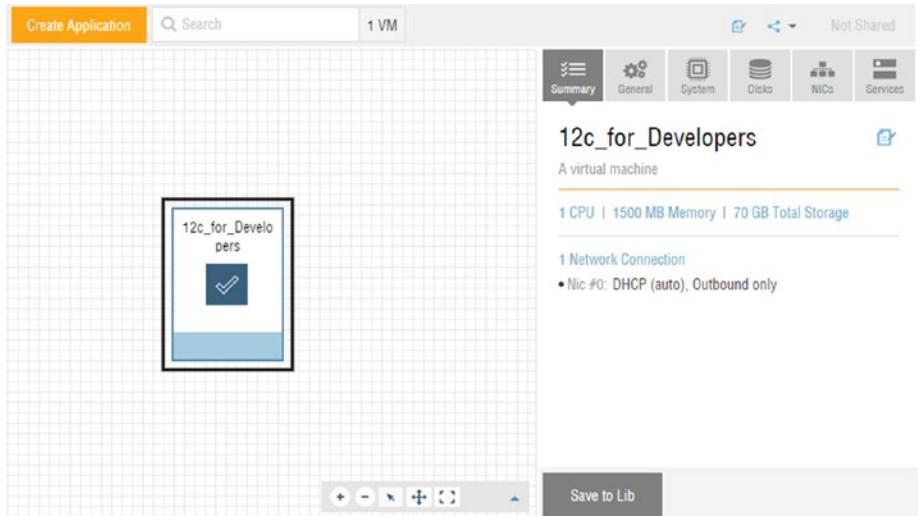


Figure 4-29. Dashboard

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

The screenshot shows the 'Create Application' dialog box. The title bar says 'Create Application'. The form contains the following fields:

- Name: IaaS-Book-blue
- Description: IaaS-Book
- Bucket: Organization
- From Blueprint: IaaS-Book-bp

At the bottom of the dialog, there are two buttons: 'Create' (highlighted in orange) and 'Cancel'.

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).

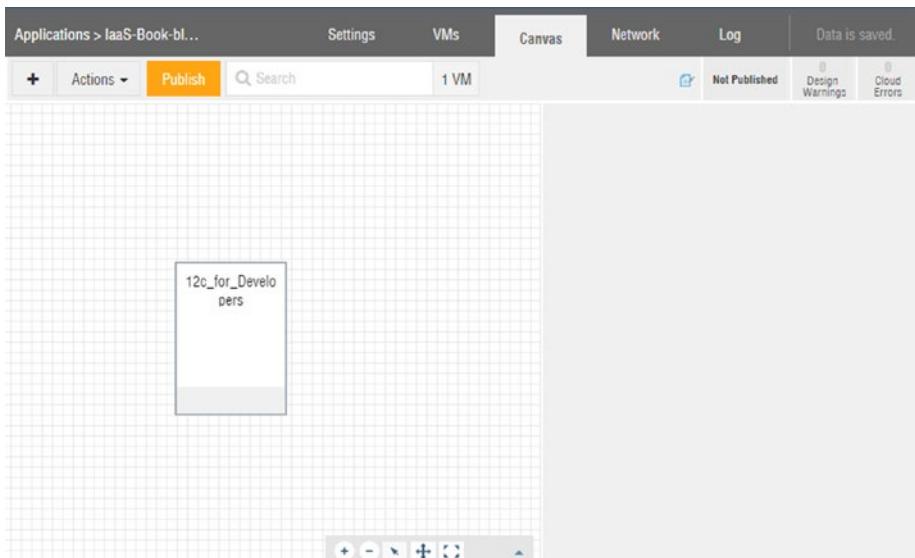


Figure 4-31. Readying the blueprint

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.

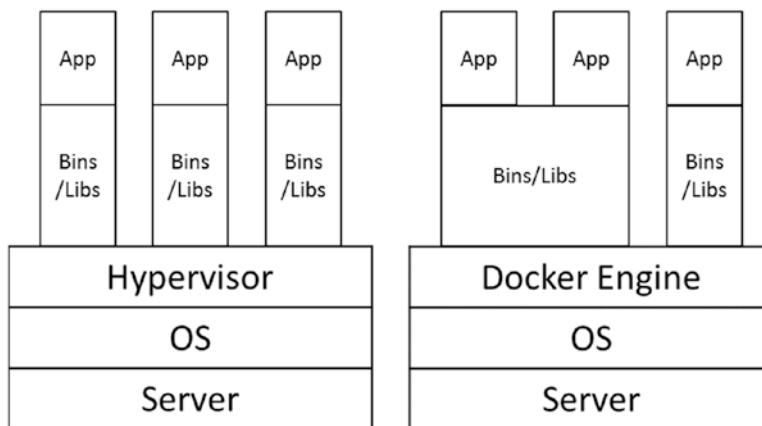


Figure 5-1. Differences between the VM and Docker container

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).

The screenshot shows the Oracle Cloud My Services interface. The main title is 'Service Details: Oracle Container Cloud Service'. On the left, there's a sidebar with 'Overview', 'Billing Metrics' (which is selected), and 'Documents'. The main content area has two tabs: 'Additional Information' and 'Metrics'. Under 'Additional Information', it shows the following details:

- Plan: Oracle Container Cloud Service
- Service Start Date: 5-Dec-2016
- Service End Date: 4-Jan-2017
- Subscription ID: 554624699
- Service Instance ID: 554625220
- Customer Account: consultant (TR)
- CSI Number: Not available
- Data Center: EMEA Commercial 2 - Amsterdam
- Status: Active
- Domain SFTP Host & Port: sftp2.em2.cloud.oracle.com:22
- Domain SFTP User Name: tcon@BX
- REST Endpoint: <https://ipsm.europe.oraclecloud.com>

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).

The screenshot shows the Oracle Cloud My Services interface. The main title is 'Service Details: Oracle Container Cloud Service'. On the left, there's a sidebar with 'Overview', 'Billing Metrics' (which is selected), and 'Documents'. The main content area has a section titled 'Billing Metrics (Displayed in timezone UTC)'. It includes buttons for 'Add Graph' and 'Export'. Below that, it says 'FROM 11/6/2016' and 'TO Yesterday'. A graph area shows 'CONTAINER OCPU Usage per Hour (OCPU Hour)' with a note 'No data to display'.

Figure 5-3. Metrics for billing

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

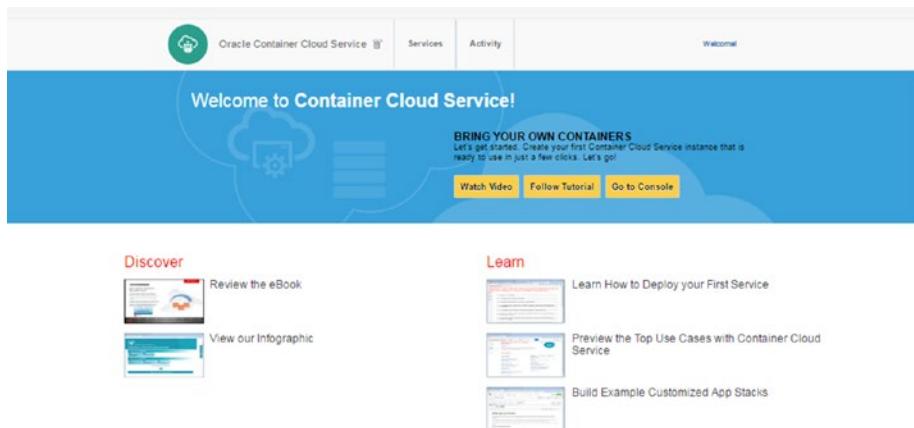


Figure 5-4. Services

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

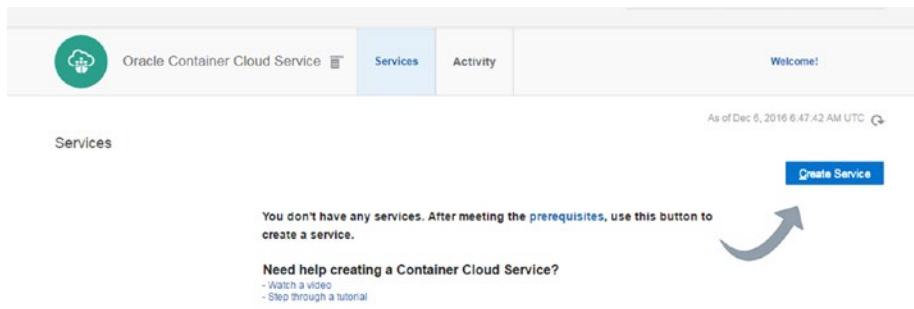


Figure 5-5. Checking container service status

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

The screenshot shows the Oracle Container Cloud Service Activity Log interface. At the top, there are tabs for Services, Activity (which is selected), and SSH Access. Below the tabs, a search bar allows filtering by Start Time, Search to Time, Service Name, Service Type, Status, and Operation. A dropdown for Results per page is set to 10, and a note indicates 1 result(s) as of Dec 6. The main table displays one log entry:

	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).

The screenshot shows the 'Create Service' wizard, Step 1: Service. The title is 'Create Service'. The steps are indicated by a progress bar: Service (selected), Details, Confirm. A 'Cancel' button is on the left and a 'Next >' button is on the right. The 'Service' step requires basic service instance information:

- * Service Name: containertest (with a tooltip: "This is the unique name used to identify the service in the tenant domain")
- Service Description: test
- * SSH Public Key: ssh-rsa AAAAB3NzaC1yc2EAA (with 'Edit' and 'Delete' buttons)

Figure 5-7. Services

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

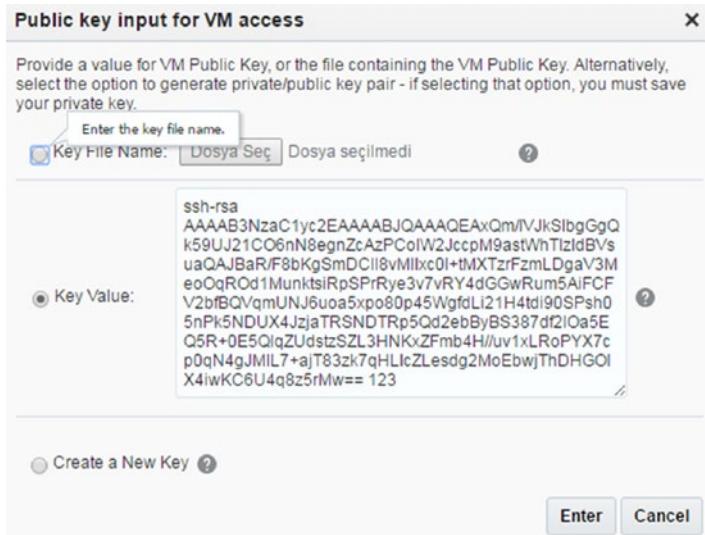


Figure 5-8. SSH

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.

The screenshot shows the 'Create Service' wizard at the 'Details' step. At the top, there's a navigation bar with 'Previous' and 'Cancel' buttons on the left, and 'Service', 'Details', and 'Confirm' buttons on the right. Below the navigation is a section titled 'Service Details' which states 'This service includes 1 management node'. To the right of this is a 'Selection Summary' link. The main area is titled 'OCCS Configuration' and contains several configuration fields with validation stars (*):

- * Admin Username: admin
- * Admin Password: [redacted]
- * Confirm Admin Password: [redacted]
- * Worker node Compute Shape: OC3 - 1.0 OCPU, 7.5GB RAM
- * Number of worker nodes: 1
- * Worker node data volume size (GB): 30

Figure 5-9. Details

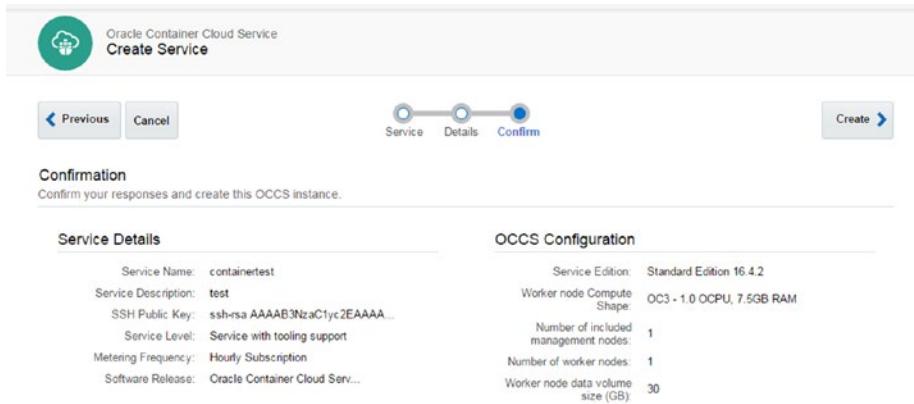
9. Check selection summary at top right (Figure 5-10).

The screenshot shows the 'Selection Summary' page. It has a header 'Selection Summary' and a table with four rows:

RA	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).

The screenshot shows the Oracle Container Cloud Service Services page. At the top, there's a green circular icon with a cloud and a database symbol, followed by the text "Oracle Container Cloud Service" and "Services". Below this, there are tabs: "Services" (which is selected), "Activity", and "SSH Access". To the right, there's a "Welcome!" message and a timestamp "As of Dec 6, 2016 6:54:01 AM UTC".

Summary	1	2	15 GB	N/A	2	—
Services	OCPUs	Memory	Storage	Public IPs		

Services

Search by service name

Service	Status	Nodes	OCPUs	Memory	Storage
containertest	Creating service ...	2	2	15 GB	N/A
	Subscription: Hourly Subscription				
	Version: 16.4.2.0.7				

[» Service Create and Delete History](#)

Figure 5-12. Services status

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

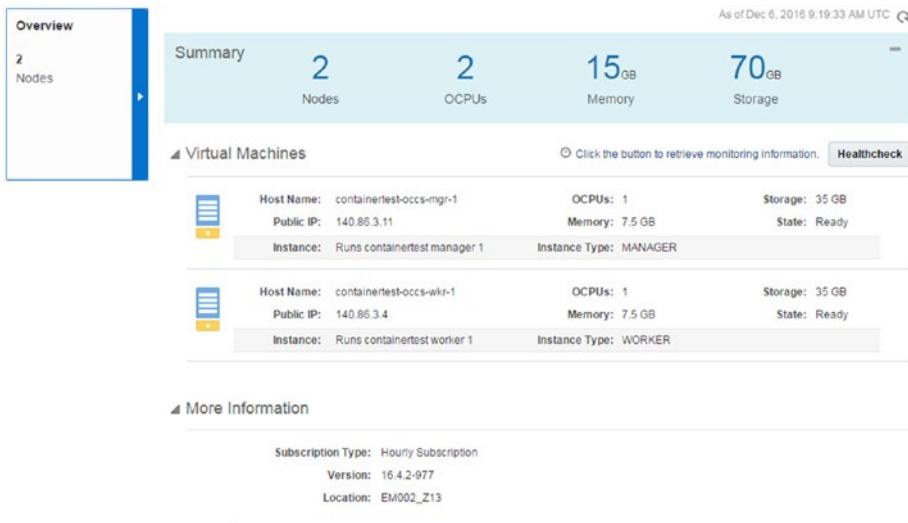


Figure 5-13. Service overview

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

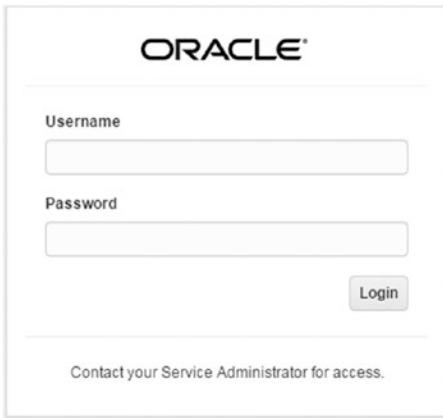


Figure 5-14. Panel

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

The screenshot shows the Oracle Container Cloud Service Dashboard. On the left is a sidebar with navigation links: Dashboard, Search, Tasks & Events, Services, Stacks, Deployments, Containers, Images, Hosts, Resource Pools, Registries, Tags, and Service Discovery. The main area is titled 'Dashboard' and contains three cards: 'Deployments' (0, OK), 'Hosts' (1, OK), and 'Resource Pools' (3). Below these are summary counts for Services (26), Stacks (3), Deployments (0), Resource Pools (3), Containers (0), Images (0), and Hosts (1). A 'Current Status' section on the right indicates 'There are no problems to report'.

Figure 5-15. Dashboard

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

The screenshot shows the 'Registries' page. It features a table with columns for Actions, URL, and Description. There is one entry: 'index.docker.io' with a description 'Public Docker Hub Registry'. Buttons for 'Edit' and 'Remove' are visible. Navigation controls at the top include 'First', 'Prev', 'Page 1', 'Next', 'Last', 'Per Page (20)', 'New Registry', 'Search...', 'Email', and 'Username'. At the bottom, there is a footer note: 'V16.4.5-1014 ©2016 Oracle and/or its affiliates. All rights reserved.'

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

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

ORACLE® Container Cloud Service

Dashboard
Get Help ▾
Settings ▾
Logout

[Search](#)
[Tasks & Events](#)

[Services](#)
[Stacks](#)
[Deployments](#)

[Containers](#)
[Images](#)
[Hosts](#)

Resource Pools

[Registries](#)
[Tags](#)
[Service Discovery](#)

Pools ▶ test

test

ID	test
Description	pool
Combined Memory	0%
Combined CPU	0%
Tags	Add Tag

[Edit](#)
[Move Hosts](#)
[Remove](#)

0
Active Hosts

0
Inactive Hosts

[First](#) < Prev Page 1 ▾ Next > Last ▾ Per Page: 20 ▾

There are no hosts to display.

Search...

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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).

The screenshot shows a 'New Pool' dialog box with the following fields:

- Name:** An input field containing a single vertical bar character.
- ID:** An empty input field.
- Description:** A large empty text area.

At the bottom right are two buttons: **Cancel** and **Save**.

Figure 5-19. New Pool

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

The screenshot shows the Oracle Container Cloud Service interface with the following details:

- Left Sidebar:** Includes links for Dashboard, Search, Tasks & Events, Services, Stacks, Deployments, Containers, Images, Hosts, Resource Pools (selected), Registries, Tags, and Service Discovery.
- Header:** Shows 'ORACLE Container Cloud Service' and navigation links for Get Help, Settings, and Logout.
- Main Content:** A 'Pools' section titled 'test'. It displays the following information for the 'test' pool:
 - ID: test
 - Description: pool
 - Combined Memory: 0%
 - Combined CPU: 0%
 - Tags: Add Tag
- Hosts Section:** Shows 0 Active Hosts and 0 Inactive Hosts.
- Bottom:** A message stating 'There are no hosts to display.' and the copyright notice 'v16.4.5-1014 ©2015 Oracle and/or its affiliates. All rights reserved.'

Figure 5-20. Resource Pools

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

Status	Hostname ▾	IP Addresses	Pool	Containers	Tags
<input checked="" type="checkbox"/> ACTIVE	container-occs-wkr-1	eth0: 10.196.50.42 <2 more	test		

Buttons at the bottom: Toggle Page, Toggle All, Add Tag to Selected.

Buttons at the bottom right: Cancel, Add Selected Hosts.

Figure 5-21. Hosts

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

Pools ▶ test

test

ID	test
Description	pool
Combined Memory	0%
Combined CPU	0%
Tags	Add Tag

Buttons: Edit, Move Hosts, Remove.

Host list table:

Status	Hostname ▾	IP Addresses	Pool	Memory	CPU	Containers	Tags
<input checked="" type="checkbox"/> ACTIVE	container-occs-wkr-1	eth0: 10.196.50.42 <2 more	test				

Buttons at the bottom: First, Prev, Page 1, Next, Last, Per Page: 20, Search, Cancel, Add Selected Hosts.

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).

Actions	ID	Name	Description	
Deploy	Edit	Remove	alpine:1.10.0	Alpine Linux Runs an example alpine linux container that executes for 10 minutes and prints out a hello world message to the terminal. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	apache	Apache A Docker image with Apache and PHP. After the container deploys successfully, visit port 9001 on the host to see the phpinfo page. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	busybox	BusyBox Runs a BusyBox image that executes for 10 minutes and prints out a hello world to the terminal. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	cadvisor	cAdvisor A LAdvisor container that runs on port 8080 on the host. By default, this image will be deployed to all hosts. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	cassandra	Cassandra The officially supported Apache Cassandra image. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	datadog	Datadog The officially supported Datadog image. You will need to add your API key to publish data to your datadog account. This example is provided as-is for educational purposes and should not be used in production.
Deploy	Edit	Remove	golang	Go Example Application An example golang container that runs for 10 minutes and prints out a hello world to the terminal. This example is provided as-is for educational purposes and should not be used in production.

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).

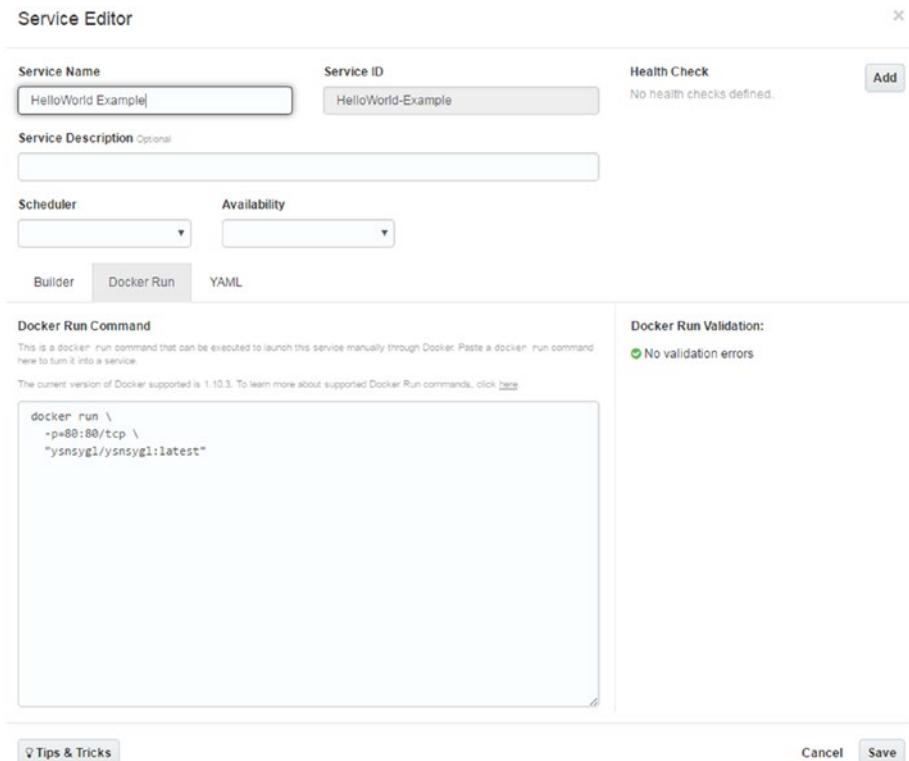


Figure 5-24. Service Editor

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).

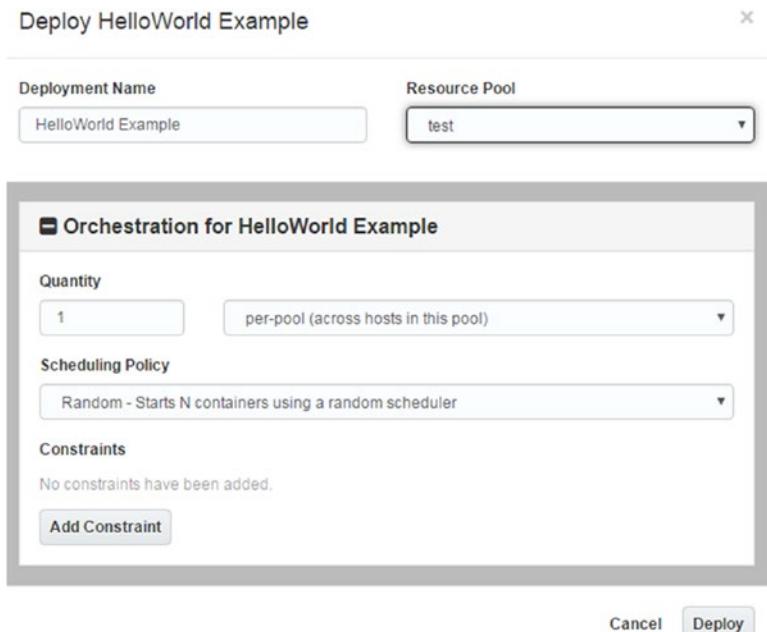


Figure 5-26. Example

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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