Oracle® Cloud

Using Oracle Ravello Cloud Service

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Contents

7 Frequently Asked Questions

Preface

Learn how to deploy your existing VMware or KVM based data center workloads on public cloud using Oracle Cloud Infrastructure Ravello Service

Topics

Audience

Using Oracle Cloud Infrastructure Ravello Service is intended for members of Development and Operations teams who want to set up, manage, monitor and deploy their environments to cloud using the features offered by Oracle Cloud Infrastructure Ravello Service.

Documentation Accessibility

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Access to Oracle Support

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Related Resources

For more information, see these Oracle resources:

- Oracle Public Cloud

  `http://cloud.oracle.com`

- *Getting Started with Oracle Cloud*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Getting Started with Ravello

To get started with Oracle Cloud Infrastructure Ravello Service, review some basic concepts and the steps required to access the service in Oracle Public Cloud.

Topics

About Oracle Cloud Infrastructure Ravello Service

With Oracle Cloud Infrastructure Ravello Service, you can deploy your existing VMware or KVM based data center workloads on any public cloud such as Oracle Cloud, Amazon Web Services (AWS), and Google Cloud, as-is, without any modification to the virtual machines, network, or storage.

Ravello allows you to create replicas of your on-premises, multi-tier VMware or KVM based applications in the cloud. You can then create blueprints of each application, so you can quickly deploy multiple instances of the application for testing or other purposes.

Oracle Cloud Infrastructure Ravello Service Terminology

Before you begin using Oracle Cloud Infrastructure Ravello Service you should be familiar with basic Ravello terminology.

Term	Definition
Hypervisor	Software which creates and runs virtual machines (VM).
Nested Virtualization	Running a virtual machine within another virtual machine.
Application design	A set of definitions that describe an application, including virtual machine images, supplied and required service interfaces, and connectivity, as applicable.

Term	Definition
Application	Any set of virtual machines, network and storage devices and their configuration that you want to make available to users. An application also refers to an instance of an application that can be published or that is already running on the cloud. Multiple instances (or copies) of the same application can run at the same time.
Blueprint	A blueprint is a self-contained set of definitions that describe your application, which can be used to create instances and deploy them on the cloud. A blueprint comprises a snapshot of an application instance and is created from an application design.
Key Pairs	When working with generic or public VM templates, you can connect to VMs using predefined SSH key pairs. However, you can also add or import key pairs while creating a new application that is based on a public VM.
Publishing	Publishing is the process of deploying an application in a cloud environment. Publishing the application instance creates multiple virtual machines in the cloud and defines the network overlay.
Ravello Repo	A portal where users can share their blueprints, VMs, and disk images with others.

Interfaces to Oracle Cloud Infrastructure Ravello Service

Oracle Cloud Infrastructure Ravello Service provides the following ways to access, create, and manage your Ravello applications.

Type of Access	Description	More Information
Oracle Cloud Infrastructure Ravello Service Web-based console	This console provides a graphical user interface to create, manage, and modify your application instances.	Accessing Oracle Cloud Infrastructure Ravello Service Using the Web Console
Oracle Cloud Infrastructure Ravello Service REST API	Code REST requests to call methods to programmatically create, manage, and modify the application instances you have created on Oracle Cloud Infrastructure Ravello Service.	Ravello REST API

Before You Begin with Oracle Cloud Infrastructure Ravello Service

Before you begin using Oracle Cloud Infrastructure Ravello Service, there are several steps you can take to prepare.

1. Understand the features of Oracle Cloud Infrastructure Ravello Service.

   See About Oracle Cloud Infrastructure Ravello Service.

2. Review your current virtual machine environment and consider your options for deployment in the cloud.

   See Assessing your Deployment Scenario.

How to Begin with Oracle Cloud Infrastructure Ravello Service

To get started with Oracle Cloud Infrastructure Ravello Service, you must request a trial or paid subscription and activate the service.

To begin using Oracle Cloud Infrastructure Ravello Service:

1. Request a trial or purchase a subscription for Oracle Cloud Service.

   See Subscribing to an Oracle Cloud Service Trial in *Getting Started with Oracle Cloud*.

2. Activate the service. See Activating Your Trial Subscription or Activating Your Order in *Getting Started with Oracle Cloud*.

3. Verify activation. See Verifying That Your Trial Is Running or Verifying That a Service Is Running in *Getting Started with Oracle Cloud*.

Accessing Oracle Cloud Infrastructure Ravello Service Using the Web Console

You can access the web console by setting up a Ravello account.

1. If you are the initial identity domain administrator or service administrator, Oracle Cloud sends you a 'Welcome to Oracle Cloud' email that contains your user name, your temporary password, the Identity Domain, the data center, and the URL for the My Services application. An Identity Domain controls the accounts of users who need access to service instances. It also controls the features that authorized users can access.

2. After you set up the My Services account, Oracle Cloud will send an email to set up your Ravello account.

3. Follow the instructions provided in the email and create an administrator account for Ravello. Add users and set permissions, see Users and Permissions Groups.

> **Note:**
>
> Note that the credentials for the primary administrator for the account on Oracle Public Cloud (My Services) may be different from the one on Ravello.

Accessing Oracle Cloud Infrastructure Ravello Service Using REST API

You can programmatically provision and manage Ravello by using a REST (REpresentational State Transfer) application programming interface (API).

Each REST API call maps to an HTTP request: getting an object (`GET`), adding an object (`POST`), updating an object (`PUT`), and deleting an object (`DELETE`). The HTTP response code indicates whether the request was successful. Each object for which you can perform the `GET`, `POST`, `PUT`, and `DELETE` requests is identified uniquely by its URI (Uniform Resource Identifier).

To access Oracle Cloud Infrastructure Ravello Service by using the REST API you must use the REST endpoint URL that Oracle provided when your administrator subscribed to the service. See Ravello REST API.

Assessing your Deployment Scenario

Determine your deployment scenario and use Oracle Cloud Infrastructure Ravello Service to build applications and migrate a diverse set of general purpose and high-performance workloads to the cloud.

Scenarios	Description	More Information
Creating and Deploying Ravello Applications to Cloud	Deploy your existing VMware or KVM-based data center workloads on leading Cloud providers, as-is, without any modification to the VMs, network, or storage.	In this scenario, you use the Ravello VM Import tool to upload your VMs or your entire application to Ravello. Then you create or verify the application in Ravello before you deploy it to the cloud. After you create and validate your application, you will publish your application to cloud.
Creating and Distributing Blueprints From the Published Ravello Applications	Create, manage, and distribute blueprints from the validated and published applications.	In this scenario, you save the published application as a blueprint and distribute it with others.
Deploying Ravello Applications to Cloud Using Blueprints	Using private and/or public blueprints that are already validated and available.	In this scenario, you will use the available blueprint and spin up as many applications as you need.

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Creating and Deploying Ravello Applications to Cloud

Learn how to create and design a new Ravello application for your VMs and deploy it to cloud.

Topics

Installing the VM Import Tool

You can import your virtual machines (VMs) or disk images either by using the Ravello Import Tool or command line interface (CLI) Import Tool. The CLI allows you to import your VMs and will give you the flexibility of automating the import process.

Download the tool from the Ravello VM Import Tool page and import your VMs using the Ravello console. You can install the VM Import Tool on a Windows, Linux, or Mac OS X host.

Alternatively, you can install the Ravello VM Import Tool from the Ravello console itself. The URL of the Ravello console is typically provided to you by your Oracle Cloud Account administrator. It is also available in the Welcome email received when you subscribed to Oracle Ravello Cloud Service. Log into the Ravello console:

- Select the **Library** > **Disk Images** page, click **+ Import Disk Image**. If the VM Import Tool has not yet been installed, the following web page is displayed: “Unable to connect to the Ravello VM Import Tool” with the options for downloading the tool.
- Select the **Library** > **VMs** page, click **+ Import VM**. If the Import Tool has not yet been installed, the following web page is displayed: “Unable to connect to the Ravello VM Import Tool” with the options for downloading the tool.

Downloading the GUI VM Import Tool

If you select **Download GUI VM Import Tool**, then you can import VMs from within the Ravello user interface.
Install the tool according to the Operating System (OS) you selected:

- For a Windows operating system, follow the on-screen instructions to download and install the utility.

- For a Mac operating system, double-click the `ravello_mac.dmg` file and drag it into the installation folder.
- For a Linux operating system, download and extract the `ravello_linux.tar.gz` installation file. This will automatically creates the Ravello folder in your system. Run the `Ravello\installer.sh` file to install the utility. If any dependency file is missing, follow the on-screen instructions to install the missing files.

Downloading the CLI VM Import Tool on a Windows Host

The CLI method allows you to import your VMs offline and will give the flexibility of automating the import process. If you select **Download CLI VM Import Tool**, then extract the file provided and use the CLI method to import your VMs.

1. Select **Download CLI VM Import Tool** and download the zip file.
2. Extract the zip file from the downloaded location and run the executable file.

> **Note:**
>
> If a problem occurs, follow the instructions contained in the README file to install the CLI using a python script.

Locating and Verifying the VM Import Tool Installation

All the installation files are saved under `C:\Program Files (x86)\Ravello Systems`. When you download the Ravello VM Import Tool, an icon will appear on the taskbar to notify you that the task is running. If it is not running, then on the Windows machine, run the executable file from `C:\Program Files (x86)\Ravello Systems\Ravello import utility\ravello_vm_import_server.exe`.

Downloading the CLI VM Import Tool on a Linux or Mac OS X Host

The CLI method allows you to import your VMs offline and will give the flexibility of automating the import process. If you select **Download CLI VM Import Tool**, then extract the file provided and use the CLI method to import your VMs.

1. Select **Download CLI VM Import Tool** and download the zip file.
2. Extract the zip file from the downloaded location.
3. Run the command `./install.sh`.

Adding Proxy Settings for Image Uploads

If you are working in an environment where a proxy is needed to access the internet, you need to manually configure the proxy settings before you can use the import tool.

To add the proxy settings:

1. In the `C:\Program Files (x86)\Ravello Systems\VM import utility` directory, add a `config.properties` file that contains these lines:

```
[upload]
proxy_address = <ip address of proxy server>
proxy_port = <port on which the proxy server accepts connections>
```

If your proxy is using basic authentication, then add user and password to the same configuration file:

```
            [upload]
            proxy_address = <ip address of proxy server>
            proxy_port = <port on which the proxy
server accepts connections>
            proxy_username = <proxy user>
            proxy_password =  <proxy password>
```

2. Save the `config.properties` file.
   - For Windows OS:`C:\Users\user\.ravello`
   - For Linux OS: `/home/user/.ravello/`
3. Restart the Ravello Import Tool.
   - If you are using Windows OS:
     a. Go to **Windows Task Manager** > **Applications** and select `RavelloImageImportServer`.
     b. Click **End Task**.
     c. Restart the tool by navigating to **Start** > **All Programs** > **Ravello Import Utility** > **Import Tool**.
   - If you are using Linux OS, kill the `ravello-vm-upload` process and restart the utility.

Identifying and Importing the VMs and Disk Images That Make Up Your Application

You can use a set of predefined VMs or disk images, or you can import VMs to create your application.

You can import VMs or disk images as a separate action or you can import them while creating an application instance. Imported VMs are managed on the **Library** > **VMs** page and are used to create application instances. For disk images, go to **Library** > **Disk Images**.

> **Note:**
>
> Before you import your VM or disk images, download and install the VM Import tool. See Installing the VM Import Tool.

You can import VMs as described in the following sections:

- Extracting and Uploading VMs from vCenter, vSphere, or ESX Server
- Uploading a VM from a File
- Creating a VM by Uploading Existing Disk Files
- Uploading a Single Disk Image
- Importing VMs Using CLI

- Verifying Imported VMs

Extracting and Uploading VMs from vCenter, vSphere, or ESX Server

If your virtual machine is running on a vCenter, vSphere or ESX, then it is recommended that you extract it directly from those servers.

To extract and upload VMs from vCenter, vSphere, or an ESX server:

1. Stop the VMs before extracting them.
2. You will need the location of your vCenter, vSphere, or ESX server and your login credentials. After you use the VM Import Tool to connect to the vCenter, vSphere, or ESX server, you can then select VMs so they can be uploaded into your Ravello account. This process has no effect on the source VM.
3. Log in to the Ravello console and navigate to **Library** > **Disk Images** and click **+Import Disk Image**.

   When prompted, enter the password you use to log on to Ravello. You will see the VMs that are already imported and their status in the Ravello VM Import Tool page. You can upload more VMs if needed.
4. Select **Extract and upload VMs from vCenter, vSphere or ESX (recommended)** and click **Next**.
5. Enter the vCenter or an ESX IP address or host name, and the necessary login credentials, and then click **Next**.

   > **Note:**
   >
   > The top level of the hierarchy displayed varies according to whether you connect to a vCenter or a an ESX server.

6. On the **Select a VM** page, drill down to locate and select the VM to extract.
7. (Optional) If you prefer to extract the VM now but upload it later, select **Export only** and click **Choose folder** to specify the location where you want to save the extracted VM.

   > **Note:**
   >
   > You can upload the VM later by selecting **Upload a VM from OVF file or Ravello Export file** in the Ravello VM Import Tool.

8. Click **Upload**.

   The VM is added in the VM Import Tool page. The progress of the upload process is indicated for each VM.

> **Note:**
>
> If you experience slow access to vCenter VMs, usually it is due to connectivity to vCenter. It is recommended to run the tool on the same network or move only the python server.

Uploading a VM from a File

You can upload a VM from an Open Virtualization Format (OVF), Open Virtual Appliance (OVA), or Ravello export file.

To upload a VM from a file:

1. Log in to the Ravello console and navigate to **Library** > **VMs** and click **+Import VM**.

   When prompted, enter the password you use to log on to Ravello. You will see the VMs that are already imported and their status in the Ravello VM Import Tool page. You can upload more VMs if needed.
2. Select **Upload a VM from an OVF, OVA, or Ravello Export file** and click **Next**.
3. Select the file to upload and click **Upload**.

   The VM is added in the VM Import Tool page. The progress of the upload process is indicated for each VM.

Creating a VM by Uploading Existing Disk Files

You can upload your existing disk files that are in VMDK and QCOW formats and create a VM. A new VM is added to the library containing the disk images that are selected to be imported.

To create a VM by uploading disk files:

1. Log in to the Ravello console and navigate to **Library** > **Disk Images** and click **+Import Disk Image**.

   When prompted, enter the password you use to log on to Ravello. You will see the VMs that are already imported and their status in the Ravello VM Import Tool page. You can upload more VMs if needed.
2. Select **Create a new VM by uploading existing data files** and click **Next**.
3. Locate the file and upload.
4. In the **VM name** field, assign a name to the new VM.
5. Click **Upload**.

   The VM is added in the VM Import Tool page. The progress of the upload process is indicated for each VM.

Uploading a Single Disk Image

You can upload a single disk image in ISO, VMDK, or QCOW format.

To upload a disk image:

1. Log in to the Ravello console and navigate to **Library** > **Disk Images** and click **+Import Disk Image**.

   When prompted, enter the password you use to log on to Ravello. You will see the VMs that are already imported and their status in the Ravello VM Import Tool page. You can upload more VMs if needed.
2. Select **Upload a Single Disk Image** and click **Next**.
3. Select the type of file (**OVF** or **Ravello Export File**) and upload.

   The VM is added in the VM Import Tool page. The progress of the upload process is indicated for each VM.
4. When prompted, enter the password you use to log on to Ravello.
5. In the **Browse for VM** template file dialog box, select the virtual image machine data file (.vmx), and then click **OK**.

Importing VMs Using CLI

Another way to upload your VMs into Ravello are by using the Command Line Interface (CLI).

Make sure that you have installed the CLI VM Uploader before proceeding. If you have not installed the VM Uploader, go to Ravello VM Import Tool.

To upload VMs using CLI:

1. Open CLI and type `ravello upload -- disk_file = path to the VM image -u user@ravello.com --name name of the VM`
2. When prompted, enter your password.
3. When the summary appears, verify the information that it contains, and type **Yes**. The upload is initialized.

Verifying Imported VMs

Imported VMs are automatically added to the Ravello VM Library with an initial status of **Pending verification**. An imported VM or disk image cannot be used in an application before its configuration is verified.

To verify imported VMs:

1. Select the VM or disk image on the **Library** > **VMs** or (**Disk Images**) page.

   The VM properties are displayed in a series of tabs in the Details pane.
2. Review the VM properties in each of the tabs and click **Save**. The status of the VM in the Library changes from **Pending verification** to **Ready**.

Uploading and Using an ISO Image

You can upload an ISO file using the GUI or CLI Ravello Import tool and then use the ISO image to set it up as a CD-ROM image.

Upload your ISO file using the Ravello Import Tool. See Identifying and Importing the VMs and Disk Images That Make Up Your Application.

To use an ISO file as a CD-ROM:

1. Log in to the Ravello console and on the Ravello Applications page, click **New Application**. You are then prompted to provide application details such as name and description.
2. On the application canvas, drag any VM onto the workspace.
3. On the right hand side, select **Disks** in the **Details** pane.
4. Click **+ Add new** and select **Add CD-ROM**.

   A blank entry is added to the Disks list. You can use that disk to install the VM using the uploaded ISO image.
5. Select **cdrom** and click **Edit**.
6. Click **Browse** to locate the images that you have uploaded to Disks library..

   The Disk Images page is displayed.
7. Select the previously uploaded ISO image and save.

   Your ISO image appears in cdrom and enables you to create a VM from the ISO image.

Related Topics

- Creating an application
  You can create a new application instance based on your imported VMs or use an existing blueprint to modify your application.
- Publishing an application
  After you create and validate your application, you can publish your application to cloud.

Creating a Ravello Application

You can create a new application instance based on your imported VMs or use an existing blueprint to modify your application.

> **Note:**
>
> If you are creating this application based on a blueprint, then select **From Blueprint** in the Applications page and choose a blueprint from the drop-down list. If you select **Create Application** from the **Library** > **Blueprints** design workspace, then the blueprint is selected for you by default.
>
> If you are creating an application based on a public VM, then select an existing key pair from the **Key Pair** drop-down list or click to add a new key pair. For details on generating and importing key pairs, see Working With Key Pairs.

To create an application:

1. Navigate to **Applications** > **Create Application**.
2. Enter a name and description for the application.

   The application instance canvas opens in a new tab automatically.

3. All your imported VMs will be listed in the left pane, you can also find them in **Library**. In the **Canvas** tab, drag an image name from the VM Library onto the workspace. If you want it to be part of a group, drag it directly onto the group object. The group object outline turns blue when selected.

   When you drag and drop a VM on the workspace, its details appear at the right hand side on the details pane, where you can edit the image properties for the current design. The source image that was saved in the library will not be modified.

4. Check your network in the **Network** tab.

   Ravello automatically compiles a private encapsulated network for this application. When you uploaded those VMs, meta data will be parsed to extract the networking information and then a network is constructed to fit the needs of this application. So Application will have the network exactly the same way as your data center. If anything needs to be changed, see Designing or Editing a Ravello Application (Optional).

5. Optionally, you can move applications into a cost monitoring bucket and track the costs that are generated by all the applications in that bucket. Refer to Creating a New Cost Monitoring Bucket.

> **Note:**
>
> If you have not created a cost monitoring bucket, you can skip this step. You can always move the applications to cost monitoring bucket at a later time.

Related Topics

- Designing or Editing a Ravello Application (Optional)
  If you want to modify your application, for example, if you want to add another application server or configure a service, then you can edit or design your application accordingly.
- Publishing Your Application
  After you create and validate your application, you can publish your application to cloud.
- Saving a Blueprint
  A blueprint comprises a snapshot of an application instance design, including virtual machine images and their disks, and the service interfaces that enable access to the application functionality. This snapshot reflects the configuration and states of the virtual machines and their disks when the blueprint was created. You can publish multiple application instances based on the saved blueprint. For example, test engineers save multi-tier applications including networking and storage as a blueprint to test on identical copies of test environments reducing their development cycle.

Working With Key Pairs

When working with generic or public VM templates, you can connect to VMs using predefined Secure Shell (SSH) key pairs. The use of SSH gives you the option of connecting to public VMs using key pairs instead of a user name and password. Each key pair contains a public and a private key and can be generated or imported into

Ravello. The public key that is generated will be saved in Ravello, while the private key must be saved on your machine.

Key pairs are managed on the **Library** > **Key Pairs** page, however, you can also add or import key pairs while creating a new application that is based on a public blueprint. Similarly, you can access key pair functionality from the **General** tab of the **Details** pane when a public VM is selected on the canvas (for applications or blueprints).

> **Note:**
>
> The Key Pairs login is available only for VMs that support Cloud-init.

Related Topics

- Generating or Importing Key Pairs
  The key pairs generated by Ravello are compatible with Linux and Mac platforms. If you are using a Windows machine to connect to a Linux guest VM, use PuTTY or any other similar client to connect using SSH.
- Connecting to a Linux or Mac Instance Using SSH Key Pairs
  If you've created your instance using one of the publicly shared disk images or blueprints from Oracle Cloud Infrastructure Ravello Service, then you can use SSH to access your Linux or Mac instance.
- Using SSH Key Pairs from a Windows Machine
  You can use PuTTY or any other similar client to connect to your Linux guest VM from your Windows machine using SSH key pairs. This section assumes that you are using PuTTY to connect to your instance.

Generating or Importing Key Pairs

The key pairs generated by Ravello are compatible with Linux and Mac platforms. If you are using a Windows machine to connect to a Linux guest VM, use PuTTY or any other similar client to connect using SSH.

To generate a key pair:

1. Navigate to **Library** > **Key Pairs** and click **Create Key Pair**.

   The Key Pairs dialog box is displayed.

2. If you are creating applications using the public disk images or blueprints that are found in the library, then generate or import a key pair to SSH into the VM. Select your option for the key pair assignment:

   - **Generate Key Pair** — When you generate a key pair, the private key is downloaded as a `.pem` file, which can be saved on your system. The public key is saved in the VM.
   - **Import a Public Key** — Use this option when you want to associate with your public key that is stored on any of your servers. Note that when you import a key pair, only the public key is saved and used when the VM starts.

   Generated and imported key pairs are listed in the **Library** > **Key Pairs** list.

> **Note:**
>
> Once you publish the VM, you cannot change the key pairs.

Related Topics

- Working With Key Pairs
  When working with generic or public VM templates, you can connect to VMs using predefined Secure Shell (SSH) key pairs. The use of SSH gives you the option of connecting to public VMs using key pairs instead of a user name and password. Each key pair contains a public and a private key and can be generated or imported into Ravello. The public key that is generated will be saved in Ravello, while the private key must be saved on your machine.
- Connecting to a Linux or Mac Instance Using SSH Key Pairs
  If you've created your instance using one of the publicly shared disk images or blueprints from Oracle Cloud Infrastructure Ravello Service, then you can use SSH to access your Linux or Mac instance.
- Using SSH Key Pairs from a Windows Machine
  You can use PuTTY or any other similar client to connect to your Linux guest VM from your Windows machine using SSH key pairs. This section assumes that you are using PuTTY to connect to your instance.

Connecting to a Linux or Mac Instance Using SSH Key Pairs

If you've created your instance using one of the publicly shared disk images or blueprints from Oracle Cloud Infrastructure Ravello Service, then you can use SSH to access your Linux or Mac instance.

- Generate an SSH key pair before connecting to a Linux or Mac instance. See Generating or Importing Key Pairs.
- Create an external supplied service on the VM, with port 22 open. See Adding and Connecting Service Interfaces.
- Ensure that the SSH private key corresponding to the public key that you associated with your instance while creating it is available on the host from which you want to SSH to the instance.
- Ensure that the instance has a public IP address.
- Make sure that you have enabled the SSH access option on the VM before using SSH.

To SSH into a Linux or Mac VM:

1. Open an SSH client
2. Locate your private key file (for example, `ravelloDevKey.pem`). The wizard automatically detects the key you used to launch the instance.
3. To verify that the key permissions of the private key correct, run this command: `chmod 400 <private key filename>`. For example, `chmod 400 ravelloDevKey.pem`.
4. Connect to your VM using the following command: `ssh -i <private key filename> root@<EIPof VM>`. For example, `ssh -i ravelloDevKey.pem root@<EIPof VM>`

Related Topics

- Working With Key Pairs
  When working with generic or public VM templates, you can connect to VMs using predefined Secure Shell (SSH) key pairs. The use of SSH gives you the option of connecting to public VMs using key pairs instead of a user name and password. Each key pair contains a public and a private key and can be generated or imported into Ravello. The public key that is generated will be saved in Ravello, while the private key must be saved on your machine.
- Generating or Importing Key Pairs
  The key pairs generated by Ravello are compatible with Linux and Mac platforms. If you are using a Windows machine to connect to a Linux guest VM, use PuTTY or any other similar client to connect using SSH.
- Using SSH Key Pairs from a Windows Machine
  You can use PuTTY or any other similar client to connect to your Linux guest VM from your Windows machine using SSH key pairs. This section assumes that you are using PuTTY to connect to your instance.

Using SSH Key Pairs from a Windows Machine

You can use PuTTY or any other similar client to connect to your Linux guest VM from your Windows machine using SSH key pairs. This section assumes that you are using PuTTY to connect to your instance.

If you have the standard OpenSSH (.pem) key, then you have to convert keys from OpenSSH (.pem) to PuTTy (.ppk) format:

1. Download a PuTTygen tool and select **File** > **Load Private Key**.
2. Browse to open the *pem file that contains the key you want to convert.

> **Note:**
>
> By default, PuTTYGen displays only the files with extension .ppk. Select **All Files** from the drop-down list to view all file types.

3. Save the Private Key. When prompted to indicate whether you want to save the key without a pass phrase, click **Yes**. The key is saved in the `.ppk` format and can be used to connect to your VM using PuTTy SSH.

Before connecting from a Windows machine, ensure that:

- PuTTY is installed on your Windows machine. To download PuTTY, go to http://www.putty.org/.
- instance has a public IP address.
- SSH is enabled on the Windows machine.

After you prepare your machine:

1. Run the PuTTY program.

   The PuTTY Configuration window is displayed, showing the Session panel.
2. In the **Host Name** (or IP address) field, enter the public IP address of your instance.

3. Confirm that the Connection type option is set to SSH.
4. In the **Category** tree, expand **SSH** if necessary and then click **Auth**.

   The Auth panel is displayed.
5. Click the **Browse** button next to the **Private key file** for authentication. Navigate and open the private key file that matches the public key that is associated with your instance.
6. In the **Category** tree, click **Session**.

   The session panel is displayed. Save the session.

Try opening the connection. If this is the first time you are connecting to an instance, the PuTTY Security Alert window is displayed, prompting you to confirm the public key. Click **Yes** to continue connecting.

Related Topics

- Working With Key Pairs
  When working with generic or public VM templates, you can connect to VMs using predefined Secure Shell (SSH) key pairs. The use of SSH gives you the option of connecting to public VMs using key pairs instead of a user name and password. Each key pair contains a public and a private key and can be generated or imported into Ravello. The public key that is generated will be saved in Ravello, while the private key must be saved on your machine.
- Generating or Importing Key Pairs
  The key pairs generated by Ravello are compatible with Linux and Mac platforms. If you are using a Windows machine to connect to a Linux guest VM, use PuTTY or any other similar client to connect using SSH.
- Connecting to a Linux or Mac Instance Using SSH Key Pairs
  If you've created your instance using one of the publicly shared disk images or blueprints from Oracle Cloud Infrastructure Ravello Service, then you can use SSH to access your Linux or Mac instance.

Designing or Editing a Ravello Application (Optional)

If you want to modify your application, for example, if you want to add another application server or configure a service, then you can edit or design your application accordingly.

Select your application in the **Applications** page and view, edit, or design your application instance as required. If you are publishing the application for the first time, click **Publish**. If you are updating an application, click **Update** to apply the changes to a published application.

> **Note:**
>
> When you update, the entire instance will not be republished. Only the relevant changes will be updated. In some cases, a published virtual machine will be rebooted as part of the process.

Adding and Connecting Service Interfaces

You can manually add the supplied and required service interfaces to the VM images to provide entry points for accessing the application functionality.

To configure the service interfaces:

1. Select the VM instance on the **Canvas** or on the **VMs** tab, and then select the **Services** tab in the VM details pane.
2. Add the necessary service interface.
   - **Supplied Service** — A supplied service is a meta data object that indicates that the VM is listening on a specific IP:PORT. Supplied services determines how the virtual machines are used, and which IP addresses and ports it exposes. Even if your VM is configured with any other service on a port, you must configure the Supplied service for Ravello to allow communication to your VM through the configured port.

     > **Note:**
     >
     > Defining a supplied service is not enough, as Ravello does not configure the service on the VM. You need to make sure that there is such service running on the VM accepting this kind of communication.

     To add a supplied interface, click **+ Add** in the **Services** tab. Configure the service properties as required. For example, to connect (PING) to a specific VM, you will need to allow an incoming Internet Control Message Protocol (ICMP) traffic. Create a new supplied service configured as set IP protocol 1. To allow incoming traffic from outside the Ravello application, you have to configure this service as **External** (selected by default). Marking a service as **External** means that this service is available for external communication. For example, if you create an SSH or RDP Supplied service by selecting it from the drop-down and marking it as External, you can access the VM from inside the application or from your computer that is not in the same network.
   - **Required Service** — This to indicate which services are being consumed by the VM. Required services are used for documentation purposes, to graphically indicate the connections between the VMs on the canvas. This setting is optional; it doesn't change any configurations within the VM.
     To add a Required service, click **+ Add** > **Add Required Service** in the **Services** tab.

> **Note:**
>
> Note the following:
>
> - To manually connect a supplied service to a required service, select a service and then click and drag the cursor to the second service. A connecting line is added to the blueprint.
> - The services must be of different types (supplied and required) and must be located on separate VM objects. Note that the multiple required services can be connected to a single supplied service.

Adding User Data Scripts

You can add user data scripts to your instance which can be used for automated configuration tasks.

To add user data scripts:

1. Open your application and select the VM.
2. On the right side, select **General**.
3. Under **Cloud Init Configuration**, select **Cloud-init is installed on this VM**.
4. Add your script in the **User Data Script** field and save the configuration. Your script will be executed when the machine is booted.

Example 1:

```
#!/bin/sh
echo ‘my_script' > /tmp/my_script
```

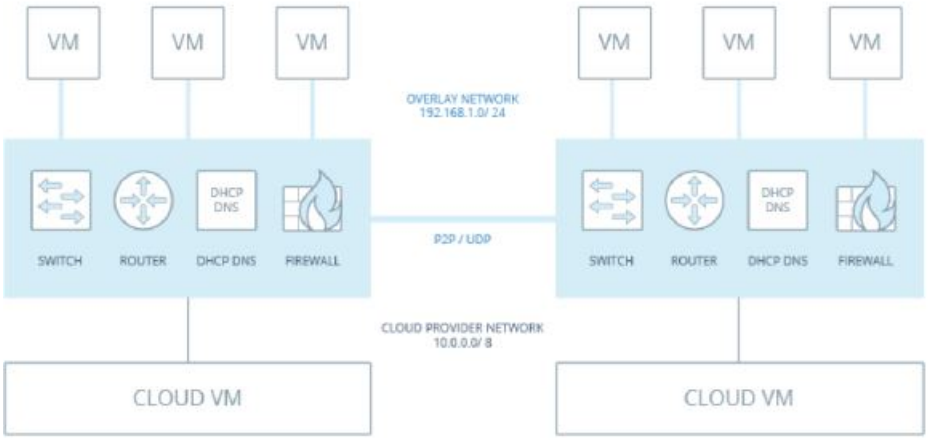
Example 2:

```
#cloud-config
ssh_import_id: [smoser]
apt_sources:
- source: "ppa:smoser/ppa”
```

Viewing the Network Architecture

Verify your network architecture for your application or blueprint on the Network tab of the Application page.

Oracle Cloud Infrastructure Ravello Service allow you to run existing multi-VM applications without any modifications in the cloud. When you drag and drop a VM into the Ravello Canvas, network details including subnets, routers, and supplemental services such as dynamic host configuration protocol (DHCP), domain name service (DNS) servers, and firewalls are automatically updated. The virtual network will look exactly like your data center network.



Setting up VM Properties

This section provides a few quick tips to make changes to your network.

IP Configuration

You can add a public IP address, Elastic IP Address, or Port Forwarding to a NIC.

1. In the Ravello application, select your VM and on the **NICs** tab click **Add IP** under IP Configuration.
2. Select one of the options: DHCP or Static IP, and enter the IP configuration details.
3. Select **Public IP**, **Elastic IP**, or **Port Forwarding** and save the configuration.

IP Filter

You can define and enable an IP filter that allows traffic only from authorized IP addresses. To enable IP filter:

1. In the **Network** tab, navigate to **IP Filtering**.
2. Go to **Properties** to **Enable Security Rules**. By default, it is disabled to allow traffic from all IP addresses.
3. Click Security Rules and create rules either to allow or deny the traffic.
4. Enter the IP address and subnet mask in the mandatory fields and save the configuration.

click the **IP Filtering** icon on the Canvas page. To allow network traffic only from the specific IP addresses, select **Is Active** in the **IP Filter Properties** pane.

Alternatively, you can disable the IP filter and allow traffic from all IP addresses.

Setting anti-affinity rules

Sometimes you may need to set the anti-affinity rule to support high availability. For each unpublished VM, you can assign a group so that the VM on different availability groups are located on separate cloud hosts. However, it is not certain that all the VMs on the same region are located on the same host.

1. In the Ravello application, select your VM.

2. To assign a group to the VM, on the **General** tab, select a group in the **Availability Group** drop-down list.

> **Tip:**
>
> For example, if you want to implement your HA cluster with or without a load balancer, then select one node on **Ravello Availability Group 1** and the other node on **Ravello Availability Group 2**.

3. Save the configuration.

> **Note:**
>
> Once the VM is published, you will not be able to change the availability group.

Publishing Your Application

After you create and validate your application, you can publish your application to cloud.

To publish an application:

1. After you validate your application, in the Application Canvas workspace, click **Publish**.

   The **Publish Application** dialog box is displayed.

2. Each time you deploy an instance of your application, you can choose to optimize your deployed application for cost or for performance. If you select,
   - **Cost Optimization** — Ravello auto-selects the best public cloud from the supported region list to meet your application requirements at the lowest possible cost.
   - **Performance Optimization** — you decide on which specific cloud region your application instance will be deployed, and you experience highest performance possible.
3. Select the duration for which you want to run the application before it is stopped automatically. The default is 2 hours. If you select **Never**, then the application will never stop until you manually stop the application.
4. View the publishing cost for the selected type of optimization, cloud provider, and region in Detailed Pricing.
5. Click **Publish** to deploy your application to cloud. The publishing process might take a few minutes.

> **Note:**
>
> After you publish an application, you cannot make changes to the Cloud-init configuration where key pair is defined. This setting must be configured in the VM before publishing it to the cloud.

When you publish an application, Ravello mounts its own hypervisor on the cloud and will run your virtual machines directly on it without using any of your hypervisors.

Related Topics

- Creating and Distributing Blueprints From the Published Ravello Applications
  A blueprint is a self-contained set of definitions that describe your Ravello application, which can be used to create instances and deploy them on the cloud. You can deploy clones of the blueprint on cloud regions of choice using the application design or API call.
- Deploying Ravello Applications to Cloud Using Blueprints
  Each saved blueprint can be used to spin up an isolated multi-node lab environment in the cloud for testing, learning and training. You do not need any hardware, these environments run using Ravello's nested virtualization on Oracle Public Cloud, AWS or Google. They are completely configured and ready to go.

3

Creating and Distributing Blueprints From the Published Ravello Applications

A blueprint is a self-contained set of definitions that describe your Ravello application, which can be used to create instances and deploy them on the cloud. You can deploy clones of the blueprint on cloud regions of choice using the application design or API call.

Topics

Modifying a Copied Blueprint

You can make a copy of any blueprints that has been shared with you, and then modify the copied blueprint including adding additional VMs, changing networking, and customizing it. You can save the modified blueprint in your library for later use.

To make a copy of shared blueprints for editing:

1. Navigate to the **Library** > **Blueprints** page.
2. Click **Shared with me** to see a list of blueprints that are shared with you.
3. Select a blueprint and click **Copy to My Blueprints** .

> **Note:**
>
> You cannot edit a saved blueprint but you can copy an existing blueprint and make changes to it.

4. Your copy is saved at the **Library** > **Blueprints** page and it is ready for editing.

Related Topics

- Using an Available Blueprint
  You can use any blueprint that has been shared with you or on Ravello Repo to spin up as many applications as you need.
- Creating and Distributing Blueprints From the Published Ravello Applications
  A blueprint is a self-contained set of definitions that describe your Ravello application, which can be used to create instances and deploy them on the cloud. You can deploy clones of the blueprint on cloud regions of choice using the application design or API call.

Saving a Blueprint

A blueprint comprises a snapshot of an application instance design, including virtual machine images and their disks, and the service interfaces that enable access to the application functionality. This snapshot reflects the configuration and states of the virtual machines and their disks when the blueprint was created. You can publish multiple application instances based on the saved blueprint. For example, test engineers save multi-tier applications including networking and storage as a blueprint to test on identical copies of test environments reducing their development cycle.

Blueprints library

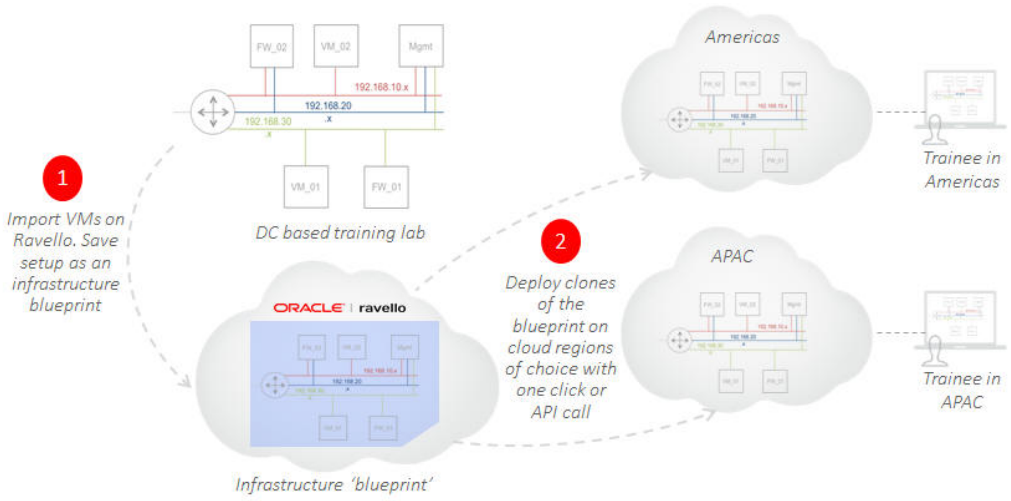
You can create blueprints for one or more complete copies of applications to replicate at a later time. After you create an application, select **Save as Blueprint** in the **Applications** page. If your VMs are running, you can save blueprints either by shutting down the VMs or while it is running. In either case, the blueprint capture process might take a few minutes.

Blueprints can be viewed, managed, and deleted from the **Library** > **Blueprints** page.

> **Note:**
>
> You cannot edit the saved blueprints.

Example 3-1 Setting up of training environments using blueprint

With the help of saved blueprints, trainers can deploy VMware training labs ‘as-is’, and create as many clones in different cloud regions as needed.



Sharing a Blueprint

Blueprints are created from application instance designs, either draft designs or designs with all VMs running. You can share the saved blueprint either on a Ravello Repo for public users or with a user from other organization.

Topics

Sharing a Blueprint on Ravello Repo

Ravello Repo is a platform for experts to collaborate with each other and create blueprints that the rest of the community could benefit from. Repo provides a great starting point for customized development, testing and learning labs.

You must have a public profile before you can share or use library items on Ravello Repo, see Setting up Public Profile.

Ravello Repo is a repository where you can use or share blueprints of environments with interesting and new technology components. You can either share a blueprint with others or find fully functional multi-VM environment, that you can download to your account and start building your lab. For example, in the Ravello Repo, you may find the blueprints that cover topologies from simple RHEL 6 to RHEL 7 migration testing environments to complex multi-node OpenStack and vSphere AutoLab environments. You can leverage these blueprints and easily spin up entire live environments in the cloud, study topologies, and make changes according to your needs.
To share a blueprint on Ravello Repo:

1. Navigate to **Library** > **Blueprints** and select the blueprint that you want to share with others.
2. Click **Share** and select one of the options:
    a. **Manage Sharing**
    b. **Share Publicly on Ravello Repo**
3. Follow the prompts and share your blueprint on Ravello Repo.

Related Topics

- Sharing a Blueprint With an External User
  You can share a blueprint only with an external user other than from your organization. To allow a user from your own organization to view and use a blueprint, you must assign them to permissions groups where the viewing of shared items are enabled.

Sharing a Blueprint With an External User

You can share a blueprint only with an external user other than from your organization. To allow a user from your own organization to view and use a blueprint, you must assign them to permissions groups where the viewing of shared items are enabled.

Make sure that the blueprint does not contain any confidential or proprietary information before sharing it with others.

To share a blueprint with a specific user:

1. From the **Library** > **Blueprints** page, select the blueprint you want to share and:
   - Click **Share** > **Manage sharing**, and click **Another Organization** in the **Manage Blueprint Sharing** dialog box.
   - Click **Share** > **Share with Others**.

   A screen **Share with Users In a Different Organization** is displayed.
2. (Optional) Click **Review/edit blueprint documentation** to update the description of the blueprint that is visible to others.
3. In the **Share with Users** field, enter an email address to share your blueprint.
4. Read the terms and conditions and share your blueprint.

Instructions will be emailed to the user regarding your shared blueprint.

Related Topics

- Sharing a Blueprint
  Blueprints are created from application instance designs, either draft designs or designs with all VMs running. You can share the saved blueprint either on a Ravello Repo for public users or with a user from other organization.
- Sharing a Blueprint on Ravello Repo
  Ravello Repo is a platform for experts to collaborate with each other and create blueprints that the rest of the community could benefit from. Repo provides a great starting point for customized development, testing and learning labs.

4

Deploying Ravello Applications to Cloud Using Blueprints

Each saved blueprint can be used to spin up an isolated multi-node lab environment in the cloud for testing, learning and training. You do not need any hardware, these environments run using Ravello's nested virtualization on Oracle Public Cloud, AWS or Google. They are completely configured and ready to go.

Topics

Using an Available Blueprint

You can use any blueprint that has been shared with you or on Ravello Repo to spin up as many applications as you need.

As an example, you may want to clone an application to run on another cloud or region. In such case, use a saved blueprint and deploy it to cloud. To view blueprints that are shared with you:

1. Navigate to the **Library** > **Blueprints** page.
2. Click **Shared with me**. Note that this list remains empty until a blueprint is shared with you.
3. Click on the name of the blueprint to view it on the drawing canvas.
4. Publish the application. For more details on publishing an application, see Publishing Your Application.

If you want to edit your blueprint, refer to Modifying a Copied Blueprint.

Related Topics

- Modifying a Copied Blueprint
  You can make a copy of any blueprints that has been shared with you, and then modify the copied blueprint including adding additional VMs, changing networking, and customizing it. You can save the modified blueprint in your library for later use.
- Creating and Distributing Blueprints From the Published Ravello Applications
  A blueprint is a self-contained set of definitions that describe your Ravello application, which can be used to create instances and deploy them on the cloud. You can deploy clones of the blueprint on cloud regions of choice using the application design or API call.

Modifying a Copied Blueprint

You can make a copy of any blueprints that has been shared with you, and then modify the copied blueprint including adding additional VMs, changing networking, and customizing it. You can save the modified blueprint in your library for later use.

To make a copy of shared blueprints for editing:

1. Navigate to the **Library** > **Blueprints** page.
2. Click **Shared with me** to see a list of blueprints that are shared with you.
3. Select a blueprint and click **Copy to My Blueprints** .

> **Note:**
>
> You cannot edit a saved blueprint but you can copy an existing blueprint and make changes to it.

4. Your copy is saved at the **Library** > **Blueprints** page and it is ready for editing.

Related Topics

- Using an Available Blueprint
  You can use any blueprint that has been shared with you or on Ravello Repo to spin up as many applications as you need.
- Creating and Distributing Blueprints From the Published Ravello Applications
  A blueprint is a self-contained set of definitions that describe your Ravello application, which can be used to create instances and deploy them on the cloud. You can deploy clones of the blueprint on cloud regions of choice using the application design or API call.

5

Managing Ravello Applications

Manage your Ravello applications, library items, and learn how to use your ISO file.

Topics

Managing Ravello Applications

The Applications page lists the applications instances that are created in Ravello, and indicates the aggregated status of their VMs. You can view additional details on a specific instance, including the status of each VM, by selecting it in the list.

Here are some of the main features of Ravello applications.

Recovering a VM

Recovering a VM can be useful when unknown issues occur. For example, you may have problems with cloud providers, such as a machine that is inexplicably terminated. To recover a VM:

1. In the **VMs** tab or in the published instance design, select the VM you want to recover and click **More** > **Recover**. The VM Recovery dialog box is displayed.
2. Select one of the following options:
   - **Repair** — Repairs and restarts the VM with its current settings.
   - **Republish** — The VM will revert to its original state in this application and any changes made to it will be lost. All content on the VM will be replaced. You must select **I understand the risk** in order to enable this option.

Starting and Stopping Application Instances in Stages

In an application with multiple VMs, you can configure the VMs to start and stop in stages rather than all at once. Each stage can include multiple VMs. To start and stop VMs in stages:

1. In the Applications page, go to **Settings** tab and click **See Full List**, which is under **Start/Stop stages**.

> **Note:**
>
> An unstaged VM is a VM that has not been assigned to a stage. The number of unstaged VMs is listed together with the number of stages defined for the application.

2. To create a stage, click **+Create Stage**. In the New Stage dialog box, enter the name of the stage and specify the number of minutes to wait after starting this stage before starting VMs in the next stage. Repeat to create additional stages.
3. To assign a VM to a stage:
   - Click **Unstaged VMs Pool** to view the list of VMs not yet assigned to a stage.
   - Select the VM, then select the stage you want to assign it to from the **Move to >** drop-down list. Repeat for additional VMs as required. Note that each VM can be assigned to only one stage.
4. At the bottom of the page, in the **Shutdown** area, select one of these options to define the shutdown order:
   - **All at Once**, regardless of stages.
   - **Reverse Startup Order**, the first stage that was started will be the last one to shut down.

Stopping All Instances

You can temporarily stop an application instance if it is not required. Stopping an instance does not remove its configuration; the instance retains all of its settings. You can stop all instances at once by selecting the instances and clicking **Stop**. If you are not using the application instance again, then delete it.

Viewing VM Properties

When you click an application instance name on the **Applications** page, its **Canvas** tab is displayed by default. To view information on its virtual machines in a table, select the VMs tab. The VMs included in the application instance are listed. Select a VM to view its properties in the Details pane (on the right side of the screen). The VM properties are contained in these tabs in the Details pane.

- **Summary** tab — When a VM is selected on the Application page, the **Summary** tab indicates the name of the VM, its CPU, memory, total storage space, and network connections. To edit the values of a parameter, click the corresponding link.
- **General** tab — Indicates the name, description of the VM and when it was created. You can configure key pairs, cloud-init and add scripts to run your VMs.
- **System** tab — Details the system properties of the VM.
- **Disks** tab — Details the disk size, controller and the boot status. You can even add CD–ROM image. See Uploading and Using an ISO Image.
- **Network** tab — You can implement fine-grained control over network access if required to your Oracle Cloud Infrastructure Ravello Service instances, both from other instances as well as from external hosts. When you import your VMs and create an instance, by default, your network configuration is preserved. Verify your network architecture for your application or blueprint on the Network tab of the Application page. See Viewing the Network Architecture.
- **Services** tab — The service interfaces indicate how the VM is used, and which IP addresses and ports it exposes. You can even configure SNAT, which replaces source IP address with a local IP address.

Sharing Library Items

Share your VMs, disk images, blueprints that are saved in your Ravello library with users in other organizations or on the Ravello Repo portal. Sharing an item enables other Ravello users to view and create their own copies of the item, which can then be edited to suit the needs of other organizations.

Topics

Sharing Library Items on Ravello Repo

You can share your VMs or disk images on Ravello Repo to collaborate with others.

You must have a public profile before you can share or use library items on Ravello Repo. For details on setting up your profile, refer to Setting up Public Profile.

If you make changes to the shared VM or Disk Images in your library, they are automatically updated in the version that is visible to other users. If users make changes to their own copies of the item, it will not change your VM or Disk Image. To share an item on Ravello Repo:

1. Navigate to **Library** > **VMs / Disk Images** and select your item that you want to share with others.
2. Click **Share** and select one of the options:
    a. **Manage Sharing**
    b. **Share Publicly on Ravello Repo**
3. Follow the prompts and share on Ravello Repo.

You can view any disk image or VM that has been shared with you. To view shared items, go to the **Library** > **Disk Images or VMs** page, click **Shared with me** . If the list is empty, then it means that you do not have any shared items.

Sharing Library Items With an External User

Share your disk images or VMs with a user from another organization.

Make sure that the disk image does not contain any confidential or proprietary information before sharing it.

To share a library item with a specific user:

1. From the **Library** > **Disk Images** or **VMs** page, select the item you want to share and:
    - Click **Share** > **Manage sharing**, and click **Another Organization** in the **Manage Blueprint Sharing** dialog box.
    - Click **Share** > **Share with Others**.

    A screen **Share with Users In a Different Organization** is displayed.

2. (Optional) Click **Review/edit blueprint documentation** to update the description.
3. In the **Share with Users** field, enter an email address to share your library item.
4. Read the terms and conditions and share.

Instructions regarding your shared blueprint will be emailed to the user.

6

Administering Oracle Cloud Infrastructure Ravello Service

In this section, you can learn to configure, monitor and troubleshoot Ravello.

Topics

Users and Permissions Groups

You can perform various actions in the console depending on the permissions assigned to you. A user's permissions are determined by the permissions group to which the user is assigned.

There are two predefined groups:

- Admin — has permissions for all the functionality.
- Users — default user has read only permissions for all resource types.

Depending on the requirement, you can create a customized permissions groups. When a custom permissions group is created, it does not contain any permissions. The specific permissions must be added manually by the Admin user. Different levels of permissions can be added for each resource type in keeping with the needs of your organization and the functionality required by different types of users. For example, you can grant pricing information and payment editing access to finance department personnel, without granting the permissions to manage applications, VMs, and blueprints.

> **Note:**
>
> If a user is assigned to more than one permissions group, that user inherits the combined permissions of both groups. For example, if one group assigns Read permissions for applications and another allows Read and Create permissions for application, a user that is assigned to both permissions groups can Read and Create applications.

Related Topics

- Permissions Group Management
  You can assign more than one permission to a user or a permissions group. A user with appropriate Admin permissions can create and edit permissions groups and assign users to those groups. The existing permissions groups are listed in the **Admin** > **Permissions Groups** page.
- User Management
  Primary admin of the Oracle Cloud Infrastructure Ravello Service will receive an email for setting up a Ravello account. Once the account is set up, admin can add users, set permissions, and assign each user to permissions groups. Users are managed in the **Admin** > **Users** page.

Permissions Group Management

You can assign more than one permission to a user or a permissions group. A user with appropriate Admin permissions can create and edit permissions groups and assign users to those groups. The existing permissions groups are listed in the **Admin** > **Permissions Groups** page.

> **Important:**
>
> Note the following before you create permissions group:
>
> - A permissions group can have one or more users.
> - A user can belong to multiple permissions group.
> - A permissions group can have multiple resource types.
> - For each resource type, there is a corresponding permission.

Defining Permissions groups

When you create a new permissions group, there will not be any default permission assigned to it. Permissions are granted per resource type. Custom permissions groups allow you to grant specific combinations of permissions to groups of users, ranging from highly restricted access to broad-reaching permissions.

To define permissions to a group:

1. Navigate to **Admin** >**Permissions Group** and create a group.
2. Create permissions for the created group.
   - **Resource Type** — select the resource for which want to add permissions
   - **Actions** — select the check boxes for the permission levels.
   - **Filter** — select the condition for the filter. If a filter is not defined, the permission will apply to all the objects of the resource type.
   - **Create Criterion** — select the object to be matched, the condition for a match, and the partial or full string to be matched. Repeat this step for additional criteria, as required.
3. Save the permissions for the group. A resource type is added to the Permissions page for this group.

4. Repeat the steps for additional resource types until all of the necessary permissions have been set for the group.

Editing Permissions Group

You can edit the permissions granted to custom permissions groups. Changes in permissions are automatically applied to all users assigned to the permissions group. Click on the name of the permissions group and edit. If users are assigned to the permissions group, then it appears in the lower left corner.

> **Note:**
>
> You cannot edit the predefined permissions groups. You can duplicate the permissions group and edit if necessary.

Deleting Permissions Group

Select the name of the permissions group that you want to delete and click **Delete**. Deleting a custom permissions group does not delete the users assigned to that group. However, users previously assigned only to the deleted group will no longer have any permissions. For this reason, it is recommended that you first assign those users to a different permissions group and remove them from the group you are deleting.

User Management

Primary admin of the Oracle Cloud Infrastructure Ravello Service will receive an email for setting up a Ravello account. Once the account is set up, admin can add users, set permissions, and assign each user to permissions groups. Users are managed in the **Admin** > **Users** page.

The ability of users to perform various actions in the console depends on the permissions assigned to that user. By default, there are two users (Admin and User) assigned to predefined permissions groups.

Inviting Users

If you have Admin permissions, you can invite additional users to use Oracle Cloud Infrastructure Ravello Service. To invite users, enter the user's name and e-mail address in **Admin** > **Users** > **Invite User**.

Changing Password

You can change the password anytime by clicking **Change Password** on the right hand side of the title bar. If you have admin permissions, then you can select a user on the **Admin** > **Users** page and reset the password for them.

Adding Users to a Permissions Group

Admin can assign the user to the appropriate permissions groups. If a user is not assigned to any permissions group, the user cannot use the product.

Users can be assigned to more than one permissions group. If a user is assigned to more than one permissions group, that user inherits the combined permissions of both groups. For example, if one group assigns Read permissions for applications and

another allows Read and Create permissions for application, a user that is assigned to both permissions groups can Read and Create applications.

> **Note:**
>
> If there is a need to prevent a user from performing a specific action, then make sure that the user is not assigned to any permissions group that allows that action.

To add a user to a permissions group, select a user on the **Users** page and click **Add to Permissions Group** . In the Permissions Group dialog box, select the relevant permissions group.

Disabling a User

If you have admin permissions, then you can select a user to disable on the **Admin** > **Users** page. After you disable, the user will be removed from the permissions group as well.

Granting Ephemeral Access

Ephemeral access allows you to provide limited, time-based access to a specific resource or set of resources to another person, without them being a part of your organization.

This can be very useful when integrating your own portal on Ravello infrastructure or when you want to provide an external user with temporary access. For example, you can use these tokens to grant your partners limited access to a specific demo environment, without creating a user in your environment or providing your users an extended demo environment for a limited period of time.

Creating Ephemeral Access Tokens

You can create limited or extended access tokens for your applications or blueprints. Use these tokens to grant access to one or more resources.

To create an ephemeral access token:

1. Select one or more applications in the Applications page or blueprints in the Blueprints page. Note that more than one token can be created for an application or a blueprint.
2. Click **More** > **Grant Ephemeral Access**.

   The **New Ephemeral Access Token** window is displayed.
3. Enter a name and description for the access token.
4. Set the time limit and permissions to grant access.
5. If you have selected more than one resource, then you can grant either **Different token for every application** or **All applications in a single token**.
6. Click **Create**.

   The dialog box is refreshed to display the Ravello UI URL and the API token details. Send the URL in an email to the users to allow temporary access.

> **Note:**
>
> When the time expires, users cannot access any of the granted applications or blueprints. If you want to extend the access, you can do it at any time by changing the token validity in **Applications** > **More** > **Show Ephemeral Tokens**.

You can view a list of all tokens on the **Admin** > **Ephemeral Access Tokens** page. Alternatively, you can create and edit tokens from the Applications and Blueprints pages. To view the details for a specific token, select a resource on the Applications or Blueprints page and click **More** > **Show Ephemeral Tokens** .

Related Topics

- Granting Ephemeral Access
  Ephemeral access allows you to provide limited, time-based access to a specific resource or set of resources to another person, without them being a part of your organization.

Tracking Your Ravello Cloud Usage with Cost Monitoring Buckets

With cost monitoring buckets, you can accurately track the cost of the Oracle Ravello Cloud applications that you have published. You can group your applications into categories (or buckets) and track the cost of running the applications within each bucket. Cost monitoring buckets track all the costs associated with the applications in the bucket, including compute resources, volume storage and network.

You can picture each cost monitoring bucket as a budget for a category of applications you publish. To help you stay within each budget, you can create Email-based alerts when the total costs associated with a bucket approach or reach a specific threshold.

The following sections explain how cost buckets can help you plan and monitor your Ravello Cloud usage:

- Cost Monitoring Buckets: A Typical Example
- Getting Started with Cost Monitoring Buckets
- Monitoring Your Cost Monitoring Buckets

Related Topics

- Monitoring Resource Usage
  Each user is allocated to a defined resources including running VMs and CPU hours. Admin can view the resource usage levels and status in the **Admin** > **Usage** page.

Cost Monitoring Buckets: A Typical Example

The best way to learn about cost buckets is to review an example.

Consider a scenario where you have the following categories of Oracle Ravello Cloud applications:

- Under-development applications that your software developers are using to validate new product features and see their latest code in action
- Test applications that your QA team is using to run their test plans
- Evaluation or sandbox applications that your team is using to evaluate Ravello Cloud or to experiment with a particular application topology

With cost monitoring buckets, you can create a cost bucket for each category and track how much money you are spending on each. You can then set alerts to let you know immediately when one or more of the application categories is nearing your weekly, monthly, or quarterly budget.

Related Topics

- Getting Started with Cost Monitoring Buckets
  As you gain experience with Oracle Ravello Cloud, you will likely start using it for a variety of purposes. And, as your organization publishes more applications, you will want to track your Ravello Cloud usage in more detail.
- Monitoring Your Cost Monitoring Buckets
  After you set up your cost buckets, you can select each cost bucket and review the costs generated by the various applications.

Getting Started with Cost Monitoring Buckets

As you gain experience with Oracle Ravello Cloud, you will likely start using it for a variety of purposes. And, as your organization publishes more applications, you will want to track your Ravello Cloud usage in more detail.

To get started, go to **Admin** > **Billing and Budgeting**. By default, the **Billing and Budget** page shows you the total cost of your published applications for the current month. This includes the cost of running all your published applications for the month. Each application you published is also listed, so you can see the breakdown of costs for each application. Use the drop-down in the first column to select a different month.

Related Topics

- Creating a New Cost Monitoring Bucket
  Consider creating a cost buckets for category of applications for which you have a separate budget. For example, if you typically track your testing costs versus your development costs, create a separate cost bucket for each.
- Adding a Published Application to a Cost Monitoring Bucket
  After you create a cost monitoring bucket, you can move applications into the bucket and track the costs that are generated by all the applications in that bucket.

Creating a New Cost Monitoring Bucket

Consider creating a cost buckets for category of applications for which you have a separate budget. For example, if you typically track your testing costs versus your development costs, create a separate cost bucket for each.

To create a new category (or cost bucket) from the **Billing and Budgeting** page:

1. Click **Create Bucket**.
2. Enter a name and description for the cost bucket.

3. Select where you want the cost bucket to appear by selecting a value from the **Containing Bucket** drop-down menu.
4. Click Create.

The new cost bucket appears under the selected containing cost bucket in the left navigation pane.

Related Topics

- Getting Started with Cost Monitoring Buckets
  As you gain experience with Oracle Ravello Cloud, you will likely start using it for a variety of purposes. And, as your organization publishes more applications, you will want to track your Ravello Cloud usage in more detail.
- Adding a Published Application to a Cost Monitoring Bucket
  After you create a cost monitoring bucket, you can move applications into the bucket and track the costs that are generated by all the applications in that bucket.

Adding a Published Application to a Cost Monitoring Bucket

After you create a cost monitoring bucket, you can move applications into the bucket and track the costs that are generated by all the applications in that bucket.

To add one of your Oracle Ravello Cloud applications to the new cost bucket:

1. From the **Billing and Budget** page, click the **Organization** cost bucket to display the list of all your current applications.
2. Click the **Applications** tab below the page title to manage the applications currently tracked in the top-level **Organization** cost bucket.
3. Select one or more of the applications on the **Applications** tab. When you select one or more of the applications, the **+Move** button above the last column becomes active.
4. Click **+Move** to move the selected applications to a new cost bucket.
5. Click **Create**.

Alternatively, you can add applications to a cost monitoring bucket:

- From the **Settings** tab when you are viewing or editing an application.
- On the **Create Application** dialog box when you are creating a new application.

> **Note:**
>
> When you have more than one cost bucket, you can move multiple applications from one cost bucket to another.

Related Topics

- Getting Started with Cost Monitoring Buckets
  As you gain experience with Oracle Ravello Cloud, you will likely start using it for a variety of purposes. And, as your organization publishes more applications, you will want to track your Ravello Cloud usage in more detail.

- Creating a New Cost Monitoring Bucket
  Consider creating a cost buckets for category of applications for which you have a separate budget. For example, if you typically track your testing costs versus your development costs, create a separate cost bucket for each.

Monitoring Your Cost Monitoring Buckets

After you set up your cost buckets, you can select each cost bucket and review the costs generated by the various applications.

To scan, sort, and filter the costs within each cost bucket, select the cost bucket and then use one of these options available from the each cost bucket page:

- View the detailed breakdown of costs for the selected bucket for a selected time period. You can view the total costs, as well as the cost breakdown for the applications, Elastic IPs, and Library storage.
- View the costs for a specific month or a custom time period.
- Sort the list of applications by the available columns in the table; for example, sort the applications by total cost, total up-time, or by owner.
- Search for a specific application or all the applications owned by a particular employee in your organization.
- Export the table to a CSV file, so you can pull the cost into your own spreadsheet or financial planning application.

Related Topics

- Editing the Name or Description of a Cost Monitoring Bucket
  For each cost monitoring bucket you create, you can modify the properties and set alerts. After you create a cost bucket, you can later modify the name or the description of the cost bucket.
- Setting Alerts for a Cost Monitoring Bucket
  After you create a set of cost buckets, you can set alerts that remind you when a particular cost bucket is nearing a particular total. This allows you to create and manage a budget for the applications in each cost bucket.
- Viewing your Billing Reports
  By default, the Billing and Budget page shows you the total cost of your published applications for the current month. This includes the cost of running all your published applications for the month.

Editing the Name or Description of a Cost Monitoring Bucket

For each cost monitoring bucket you create, you can modify the properties and set alerts. After you create a cost bucket, you can later modify the name or the description of the cost bucket.

To change the name or description of a cost bucket:

1. Click the name of a cost monitoring bucket in the left navigation pane.
2. Roll the mouse cursor over the title of the cost bucket until the edit (pencil) icon appears next to the cost bucket title.
3. Click the edit (pencil) icon.
4. In the resulting dialog box, you can edit the name or the description of the bucket.

> **Note:**
>
> You cannot move a cost monitoring bucket to another enclosing bucket. To move a cost monitoring bucket, you must:
>
> 1. Move all the applications out of the cost bucket, and then delete the cost bucket. You cannot delete a cost bucket that contains applications.
> 2. Create a new cost bucket and add the applications to the new cost bucket.

Related Topics

- Monitoring Your Cost Monitoring Buckets
  After you set up your cost buckets, you can select each cost bucket and review the costs generated by the various applications.
- Setting Alerts for a Cost Monitoring Bucket
  After you create a set of cost buckets, you can set alerts that remind you when a particular cost bucket is nearing a particular total. This allows you to create and manage a budget for the applications in each cost bucket.
- Viewing your Billing Reports
  By default, the Billing and Budget page shows you the total cost of your published applications for the current month. This includes the cost of running all your published applications for the month.

Setting Alerts for a Cost Monitoring Bucket

After you create a set of cost buckets, you can set alerts that remind you when a particular cost bucket is nearing a particular total. This allows you to create and manage a budget for the applications in each cost bucket.

To set an alert for a cost monitoring bucket:

1. From the **Billing and Budget** page, click the name of a cost monitoring bucket in the left navigation pane. By default, you will see the **Billing** tab, which lists the applications currently tracked by the selected cost bucket, as well as details about each application.
2. Click the **Alerts** tab to manage the alerts for the selected cost bucket.
3. To create a new alert, click **Create Alert**. The **Create Alert** dialog box appears.
4. In the **Limit ($)** field, enter a cost threshold. The amount you enter here represents the amount you'd like to budget for this bucket of applications in the given time period.
5. From the **Reset Alert** drop-down menu, select how often you want to reset the budget monitoring for the current bucket. For example, if you want to define a budget for each month, then set the **Limit ($)** field to your monthly budget amount, and then select **Monthly** from the **Reset Alert** drop-down menu.
6. In the **Description** field, optionally enter a brief description of the alert.
7. In the **Alert** section of the dialog, first indicate when you want an alert to be generated. Oracle Ravello Cloud can alert when the budget limit is reached, or when the cost total for the current bucket reaches a certain percentage of the limit.

8. In the **Send alert to** field, select the email address to which the alert will be sent.
9. Click **Create**.

Related Topics

- Monitoring Your Cost Monitoring Buckets
  After you set up your cost buckets, you can select each cost bucket and review the costs generated by the various applications.
- Editing the Name or Description of a Cost Monitoring Bucket
  For each cost monitoring bucket you create, you can modify the properties and set alerts. After you create a cost bucket, you can later modify the name or the description of the cost bucket.
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Viewing your Billing Reports

By default, the Billing and Budget page shows you the total cost of your published applications for the current month. This includes the cost of running all your published applications for the month.

From the **Billing and Budget** page, click the name of a cost monitoring bucket in the left navigation pane. By default, you will see the **Billing** tab, which lists the applications currently tracked by the selected cost bucket, as well as details about each application. Each application you published is also listed, so you can see the breakdown of costs for each application. Use the drop-down in the first column to select a different date, month, or a specific time period.

Viewing Your Deleted Buckets

You can always go back to your deleted billing and refer to it for any historical data. Click **Show Deleted Buckets** at the lower end of the left navigation pane. You will see a summarized history of transactions and activities against them by an organization for a specified date range.

Exporting Your Billing Report

You can export your organization billing report to a CSV format. To export, select an organization and click **Export to CSV**. Select all the options that you want to include in the bill and export to the CSV format.

Related Topics

- Monitoring Your Cost Monitoring Buckets
  After you set up your cost buckets, you can select each cost bucket and review the costs generated by the various applications.
- Editing the Name or Description of a Cost Monitoring Bucket
  For each cost monitoring bucket you create, you can modify the properties and set alerts. After you create a cost bucket, you can later modify the name or the description of the cost bucket.

- Setting Alerts for a Cost Monitoring Bucket
  After you create a set of cost buckets, you can set alerts that remind you when a particular cost bucket is nearing a particular total. This allows you to create and manage a budget for the applications in each cost bucket.

Monitoring Resource Usage

Each user is allocated to a defined resources including running VMs and CPU hours. Admin can view the resource usage levels and status in the **Admin** > **Usage** page.

The **Admin** > **Usage & Quota** page provides the following details:

- **Concurrent Running VMs** — The maximum number of VMs that are allowed to run simultaneously. When the number of VMs reaches the maximum value, you cannot start new VMs without stopping some of the running VMs.
- **Public IPs** — The maximum number of public IP addresses that are allowed to run simultaneously.
- **Elastic IPs** — The maximum number of Elastic IP addresses that are allowed to run simultaneously.

An orange progress bar indicates that the available resources are almost entirely utilized. When additional resources are no longer available, then the progress bar turns red.

> **Note:**
>
> The CPU resources available during the two-week free trial period are limited and cannot be increased. To change your account status, click **Upgrade** at the top of the Ravello Management Console.

Related Topics

- Tracking Your Ravello Cloud Usage with Cost Monitoring Buckets
  With cost monitoring buckets, you can accurately track the cost of the Oracle Ravello Cloud applications that you have published. You can group your applications into categories (or buckets) and track the cost of running the applications within each bucket. Cost monitoring buckets track all the costs associated with the applications in the bucket, including compute resources, volume storage and network.

Setting up Public Profile

You must set up your public profile if you are sharing library items on Ravello Repo.

To set up your public profile:

1. Click your username at the top of the Ravello interface and select **My Profile** from the drop-down list.
2. To enable others to view your profile, select **Show my profile in Ravello Repo**.
3. Fill other fields as required and save.

Related Topics

- Sharing Library Items
  Share your VMs, disk images, blueprints that are saved in your Ravello library with users in other organizations or on the Ravello Repo portal. Sharing an item enables other Ravello users to view and create their own copies of the item, which can then be edited to suit the needs of other organizations.

Viewing System Log

You can view or filter messages that are logged by the system.

To check log messages, go to **Admin** > **Log**. To include/exclude the list of messages according to **Level** (Trace, Information, Warning, or Error), select or clear the corresponding check box. You can even filter the list in any tab by entering a partial or full string in the **Filter** field.

7

Frequently Asked Questions

This reference provides answers to commonly asked questions.

Questions

I cannot upload VMs to Ravello, how do I fix this issue?

The Ravello Import Tool enables high-speed upload of disk files data to cloud storage. The upload issue may be due to your internet connection quality, speed due to proxy, firewall, or other network throttling tools that usually exist in networks. Upload logs are saved to the `store.log` file located at `/Users/<name>/.ravello/`.

Here are a few troubleshooting tips for upload issues:

Access denied error

If you see the following error: `[WindowsError: [Error 5] Access is denied: 'c:\SafeBoot.fs']`, then this indicates that your hard drive is encrypted or write protected. To fix this issue, find an alternative environment to upload your VMs or allow write permission on your hard drive.

Upload failed error

If the system clock of the machine that is using the upload tool is not set accurately, then you cannot upload VMs and you may see the following error message: `An error occurred: Upload failed because local system time is set inaccurately,`

`which makes it impossible to communicate with cloud. Please synchronize your system time.` To fix this issue, set the time and date according to the geographical location of the machine.

Connection failed error

If you attempt to open the import tool for the first time, a `Connection Failed` dialog box is displayed. If you are using the VM Import Tool from the Ravello interface, it runs as a local server handling the upload process in the background. Allow insecure content to use the import tool because the interface uses plain HTTP to communicate with the tool and HTTPS to communicate with the Ravello service.

When you see the `Connection Failed` error, click **Read More** on the error dialog and then select **Allow Insecure Content**. Alternatively, if your browser displays a security shield, click the **Shield** and then click the **Load Anyway** button.

Proxy settings

If you are working in an environment where a proxy is needed to access the internet, then configure your proxy settings before you use the Import Tool. Refer Adding Proxy Settings for Image Uploads .

Upload progress is showing 1% from a long time

The VM Import Tool uploads in chunks. The progress bar show 1% until the first chunk is uploaded and then jumps to a higher percentage. Check the log located at `/Users/<name>/.ravello/`to confirm that upload is in progress.

Why cannot I connect to a VM using SSH?

Typical SSH connection problems may be because of key pair format or Mac address configuration.

- **Key pair format**: If you are trying to connect to a VM with a Windows platform, then you need to use PuTTy to connect and the keys must be in the PPK format. Key pairs generated by Ravello are in the PEM format, but they can be easily converted to PPK using the PuTTyGen tool. For details, see Using SSH Key Pairs from a Windows Machine.
- **Mac address**: Sometimes the VM configuration is set to Automatic Mac, which means that the address is assigned automatically. You can define a fixed Mac address in the VM Editor or **Networks** tab and try to connect again.

How do I change the IP address of my VM?

1. In the application design, select the VM. Its properties are displayed in the Details pane.
2. On the **Network** tab:
   - Select **DHCP** and enter the reserved IP address in the adjacent field, or
   - Select **Static** and enter the IP address, subnet, gateway, and DNS details.
3. If the VM is already published, the VM network should be restarted for the changes to take effect.

Can I restrict access to my VM?

Yes, you can define and enable an IP filter that allows traffic from authorized source IP addresses only.

The IP filter can be configured from the **Network** tab of your application design.

1. In the **Network** tab of the your application design or blueprint, click the **IP filtering** icon. The IP Filter Properties are displayed in the details pane.
2. To allow network traffic from specific IP addresses only, select **Is Active**. The pane expands to display the Authorized Sources list.
3. To allow traffic from an IP address, click the **+Add** icon.
4. Enter the IP address and subnet mask in the designated fields. These parameters are mandatory. Repeat for additional IP addresses, as required.
5. To remove an authorized source, click the corresponding **Delete** icon.

> **Note:**
>
> To allow all network traffic, click the **IP filter** icon and select **Off** in the IP Filter Properties pane.

How will I know which blueprints are shared with me?

You can view any blueprint that are shared with you.

To view the shared blueprints:

1. Navigate to the **Library** > **Blueprints** page.
2. Click **Shared with me**. Note that this list remains empty until a blueprint is shared with you.

Can I import and use an existing Key Pair?

Yes, you can import an existing key pair and use the pairs to connect to VMs created from public blueprints.

You can create key pairs as well. See Working With Key Pairs.

Where did all the VMs in the Library page come from?

The first time you open the **Library** tab, it lists only the predefined set of virtual machine images provided by Ravello. If you have already installed and used the VM Import Utility, this list will also include any images you have uploaded into Ravello.

What VM formats does Ravello support?

Ravello supports ESXi 5.0 or higher, and KVM. If you are using ESXi images, then VMX and VMDK files are required, which can be extracted using the VMware

convertor or OVF tool. VMX files are primary configuration files and VMDK files are disk image files.

How do I know how many VMs are running?

You can view the resource usage levels and status at any time by selecting **Admin** > **Usage** from the navigation pane. The Usage & Quota page displays the number of running VMs as a part of the maximum number of VMs that you are allowed to run simultaneously.

How do I enable RDP access to a VM?

Create a supplied service to enable access to a VM from outside. A supplied service is actually a meta data object that indicates that the virtual machine is listening on a specific IP:Port.

Once a supplied service is defined as external, the packets are passed through the fenced network to the virtual machine on the service `IP:Port`. You can either define a single port or a port range.

1. Select the VM on the canvas to view its properties.
2. In the Details pane, create a supplied service in the **Services** tab as follows:
   - Click **Add**.
   - Enter the service name.
   - Select **RDP** from the **Protocols** drop-down list. If you need RDP to be exposed on a single IP, then select the IP address from the **Listen on** drop-down list; otherwise, leave the default setting **All IPs**.
   - Select the **External** check box and save.
3. If your application has already been published, click **Update** to apply changes to the cloud.

What is the added value of using Ravello API?

Using the Ravello API, Developers can integrate Ravello with the enterprise build server and continuous integration (CI) server. This can result in further automation and reduction in application development or testing time. For example, you can integrate Ravello with your Maven build process so that each time a developer checks in any code, Ravello can spin up an instance (or multiple instances) of the full application in the cloud. A series of regression tests can then be run to make sure that the latest code check-in does not adversely impact on any existing functionality.

See all the APIs that you can use with Ravello: Ravello REST API .

Is it possible to forcefully power-off a VM in Ravello?

Yes, you can follow any of the following ways to shut down a VM running on Ravello using API calls.

- `Stop` API call.

When initiating the stop API call, the system issues ACPI signals to the VM to stop it gracefully. The VM is allowed approximately 20 minutes to shut down gracefully, after which it will be forcefully taken down.

- `Shutdown` API call.

  The system issues continuous ACPI signals to the VM to stop it gracefully, without forcing it to shut down. Make sure that the VM has ACPI capabilities when using this call otherwise it might result in an endless STOPPING state.

- `poweroff` API call.

  The VM is immediately (and forcefully) powered-off.

- Shutdown from within the VM.

  You can always shut down a VM from within the VM. When you shut down a VM, Ravello's central management system detects that the VM was shut down and will change the state to STOPPED.

Can I suspend and resume VMs on Ravello?

Unfortunately, you cannot suspend and resume VMs on Ravello.

Computer mouse pointer lags and has restricted movement during console or RDP access

Install VMware tools or open-vm-tools to resolve the issue.

Install the VMware tools either by using the executable file or adding an ISO file as CD and installing the CD on the VM. Find the tools from:http://packages.vmware.com/tools/esx/latest/windows/index.html.

Linux 7 and up distributions are bundled with open-vm-tools (OVT).