

Using and Contributing Virtual Machines to VM Depot

Introduction

VM Depot is a library of open source virtual machine images that members of the online community have contributed. You can browse the library to select an image that you want to deploy as a virtual machine to your Microsoft Azure account. In addition, you can add your own image to VM Depot to share with others.

Note: VM Depot is a site maintained by Microsoft Open Technologies, a subsidiary of Microsoft Corporation. Microsoft Open Technologies provides the infrastructure for the site, but does not manage, screen, or provide support for the contributed images.

Using VM Depot

The VM Depot site provides a variety of ways for you to explore the available images and to locate images that satisfy specific criteria. Additionally, metadata about each image is available to help you understand what it contains. When you find an image to add to your Microsoft Azure subscription, VM Depot can generate a template for a deployment script that you then modify and execute.

Finding an Image at VM Depot

One way that you can browse images available at VM Depot is to go directly to the website, <http://vmdepot.msopentech.com/>, to view the list of images. You can use the search bar to filter the list for images tagged with a specific keyword, as shown in Figure 1, or search for a term in the image title, its description, or set of packages. The list of images includes a description of the image, packages installed on the image, tags to categorize the image, the publisher name, the operating system platform, and community rating. Above the list, you can click one of the sort options to change the order of images displayed in the list.

The screenshot shows the VM Depot website interface. At the top left is the logo for VM Depot PREVIEW by Microsoft Open Technologies. To the right are links for 'Subscribe' and 'Sign in and join the community'. Below the logo is a navigation bar with icons for 'Back', 'DEPLOYMENT SCRIPT', 'PUBLISH', 'VIEW', 'SHARE', and 'HELP'. The main content area has a left sidebar with 'Browse Images' and 'My Account' options. The main area features a search bar with 'ipython' entered. Below the search bar is a table with columns: 'Featured', 'Date Added', 'Name', 'Platform', and 'Rating'. Two search results are visible:

- Azure Data Science Core**: A special version of HPC Linux is now available as a Windows Azure virtual machine image. Based on OpenSUSE 12.3, this image includes all the packages you need for big data and data science computations including: - iPython - NumPy - SciPy - pandas - SvmPv - scikit-learn - scikit-image - StatsModels - matplotlib - PyTables -
Packages: cython ipython matplotlib networkx nltk nodejs numpy pandas pytables redis scikit-image scikit-learn scipy statsmodels svmnv
Tags: bigdata data hpc hpc linux ipython paratools performance python science
- Azure Data Analysis**: Includes R, openmpi and loads of packages. Include Spark 0.8, Shark 0.7 and Storm and Kafka. Also includes iPython notebook + a whole heap of libraries.
Packages: azure sdk git hive ipython ipython-notebook kafka nodejs npm numpy openjdk openjre pandas python scala scikit-learn scio
Tags: azure sdk git hive ipython ipython-notebook kafka nodejs npm numpy openjdk openjre pandas python scala scikit-learn scipy shark spark storm tornado

Figure 1: Search VM Depot by Keyword

You can click the image title to open a page that displays more information about the image, as shown in Figure 2. For example, you can see which regions can use the image and endpoints that are available in the virtual machine that you create from the image. Additionally, ratings and comments will display if available.

Azure Data Analysis



0 comments



Includes R, openmpi and loads of packages. Include Spark 0.8, Shark 0.7 and Storm and Kafka. Also includes iPython notebook + a whole heap of libraries.

Image name	Azure Data Analysis								
Publisher	elastacloud								
Platform	ubuntu								
Packages	azure sdk git hive ipython ipython-notebook kafka nodejs npm numpy openjdk openjre pandas python scala scikit-learn scipy shark spark storm tornado								
Tags	azure sdk git hive ipython ipython-notebook kafka nodejs npm numpy openjdk openjre pandas python scala scikit-learn scipy shark spark storm tornado								
Region(s)	All								
EndPoints	<table border="1"><thead><tr><th>Public Port</th><th>Local Port</th></tr></thead><tbody><tr><td>443</td><td>8888</td></tr><tr><td>80</td><td>80</td></tr><tr><td>4040</td><td>4040</td></tr></tbody></table>	Public Port	Local Port	443	8888	80	80	4040	4040
Public Port	Local Port								
443	8888								
80	80								
4040	4040								

Figure 2: VM Depot Image Details

Using Microsoft Azure Management Portal

The Microsoft Azure Management Portal also provides access to VM Depot images. You can browse available images as you part of the process to create a new virtual machine. Once you have located an image, you use a wizard interface to deploy it to your Microsoft Azure account.

Finding an Image from the Management Portal

To browse VM Depot images from the Microsoft Azure Management portal, click Virtual Machines in the list on the left side of the portal, click the Images link at the top of the page, and then click the Browse VM Depot button at the bottom of the page, as shown in Figure 3.

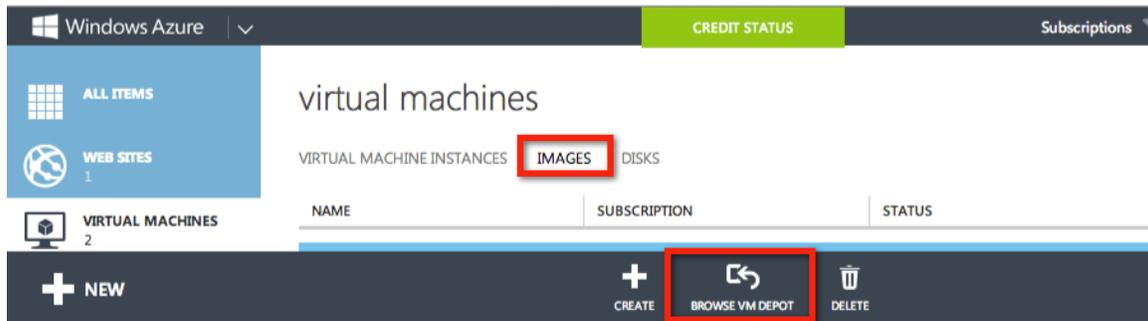


Figure 3: Browse VM Depot from Microsoft Azure Management Portal

The list of images is presented in alphabetical order, as shown in Figure 4. However, you can filter the list by operating system.

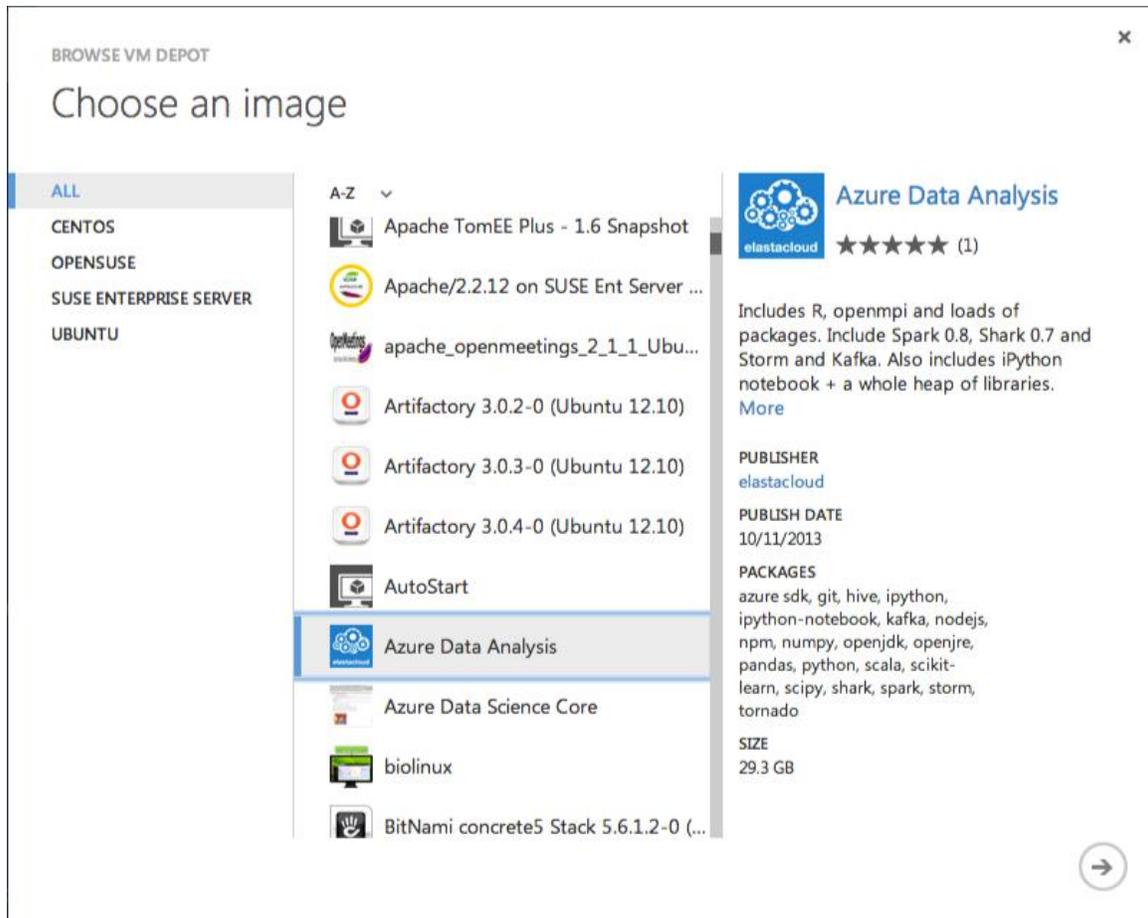


Figure 4: Browsing VM Depot Images from the Microsoft Azure Management Portal

Deploying an Image using the Management Portal

When you select an image in the Browse VM Depot dialog box and click the arrow button, you next specify a data center region to host the image and assign it to a Microsoft Azure subscription and storage account. The image is then copied to your account and appears on the Images page of the portal. The

copy process can take several minutes. When it completes, you must first register the image on the Images page of the portal and then you can create a new virtual machine based on the image by clicking the New button at the bottom of the Images page, selecting Virtual Machine, and then selecting From Gallery. In the dialog box, select My Images in the menu, and then select the image, as shown in Figure 5. You then provide configuration information for the virtual machine by specifying a name, setting a size, configuring authentication, and associating the virtual machine with a cloud service, region, and availability set. You can optionally add more endpoints during this setup process as well.

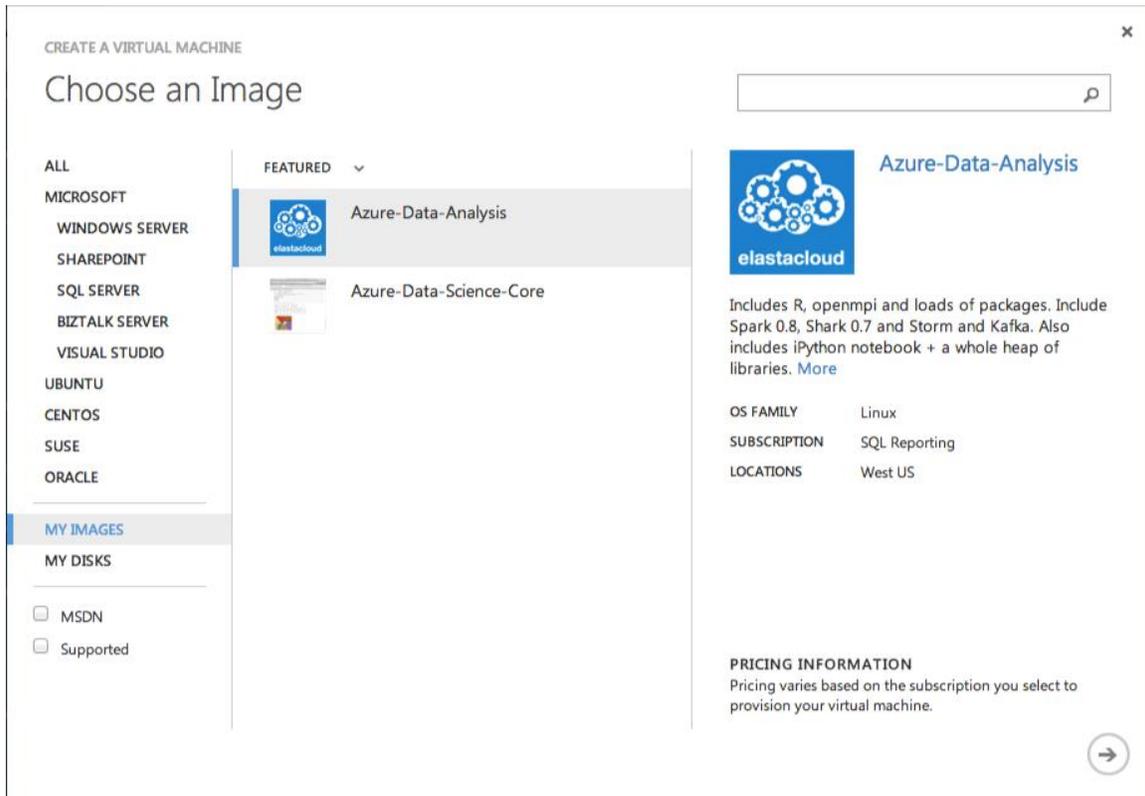


Figure 5: Virtual Machine Image Selection

Deploying an Image from VM Depot

Rather than use the management portal to deploy a VM Depot image, you can deploy an image directly from VM Depot using a deployment script. On the image list page in VM Depot, click the Deployment Script link for the image you want to deploy. If you are viewing the image page, click the Deployment Script button at the top of the page. Either way, after you agree to the terms of use for the image and select a data center region, the command to deploy the image displays, as shown in Figure 6.

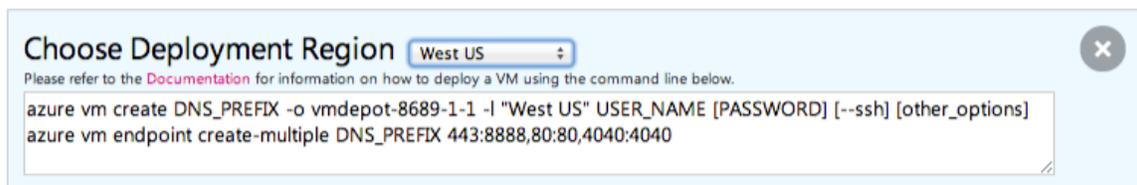


Figure 6: Deployment Script for VM Depot Image

Before you can use the command to execute the deployment script, you must first install [Node.js](#) and the [Microsoft Azure Command Line Interface \(CLI\) tools](#). Then you must configure your local environment to interact with Microsoft Azure by downloading the publishsettings file that contains subscription information and management certificates, setting the subscription to which you want to assign the virtual machine, and then specifying a storage account for the VHD disk that will be created from the image.

Download the Publishsettings File

Using the command line interface applicable to your operating system, type the following command:

```
azure account download
```

A browser window opens and, if you are not currently logged in to Microsoft Azure, prompts you to provide your account credentials. Save the file to your computer, and then import the settings by using the “azure account import” command with your publishsettings file. For example, if the file you downloaded is named My Subscription-10-15-2013-credentials.publishsettings, you include the folder into which you downloaded and enclose the full path in double-quotes like this:

```
azure account import "/Users/<your login>/Downloads/My Subscription-10-15-2013-credentials.publishsettings"
```

Delete the file when you have successfully completed the import, because it contains sensitive information about your Microsoft Azure account.

Set the Subscription

When you execute the “azure account import” command, the command line interface lists the subscriptions in your account and sets a default subscription for subsequent commands. If you prefer to use a different subscription, such as one named My Virtual Machines, type the following command:

```
azure account set "My Virtual Machines"
```

Configure a Storage Account

When the virtual machine is deployed from the selected image, a VHD is created in a Microsoft Azure Storage account. This storage account must exist before you execute the deployment script.

If you need to first create a storage account, use the “azure account storage create” command. You must specify a region and the DNS name for your virtual machine when using this command. For example, if the region is West US and your virtual machine DNS name is azuredataanalysis, type the following command:

```
azure account storage create --location "West US" "azuredataanalysis"
```

If you have an existing storage account, or just created a new storage account, you next set it as the default storage account for subsequent commands, like this:

```
azure config set "azuredataanalysis"
```

Deploy the Virtual Machine

Now you are ready to use the deployment script generated by VM Depot. However, it will require some modification before you can execute the command. Here is the deployment script for the Azure Data Analysis image:

```
azure vm create DNS_PREFIX -o vmdepot-8689-2-1 -l "West US" USER_NAME  
[PASSWORD] [--ssh] [other_options]  
azure vm endpoint create-multiple DNS_PREFIX 443:8888,80:80,4040:4040
```

Before executing the command, you must replace the capitalized text with actual values. Text in brackets is optional. For example, you can specify a virtual machine size as an option. You can learn more about other options to use with the “azure vm create” command at <http://azure.microsoft.com/en-us/documentation/articles/command-line-tools/>. To deploy a small virtual machine named `azuredatanalysis` with the default endpoints to the West US region and enabling SSH, use the following command (replacing `USER_NAME` with a login to create for the virtual machine):

```
azure vm create azuredatanalysis -o vmdepot-8689-2-1 -l "West US"  
USER_NAME --ssh --vm-size small
```

When this command executes, a container called `vm-images` is created in your storage account and the VM Depot image is added as a blob to this container. (See the section “Working with Deployed Images” later in this document to learn more about storage, containers, and blobs.) Next, the virtual machine is added with its corresponding VHD created in the `vm-images` container and then the VM Depot image is deleted.

Next, add the necessary endpoints as generated in the script, replacing `DNS_PREFIX` with your virtual machine name like this:

```
azure vm endpoint create-multiple azuredatanalysis  
443:8888,80:80,4040:4040
```

Your virtual machine created from the VM Depot image is now ready to use. You can continue to use the CLI to manage your virtual machine or use the Microsoft Azure Management Portal instead. Remember to shut down the virtual machine when you are not using it. To do this from the command line, type the following command:

```
azure vm shutdown azuredatanalysis
```

Working with Deployed Images

Technically speaking, an image is simply a template in your Microsoft Azure storage account containing a generalized version of the operating system and applications that you use to build a new virtual machine. Once you deploy an image, the image itself no longer exists and in its place you have a VHD that instantiates an operating system and applications. However, this VHD is read-only. Although you can log into the virtual machine to interact with the VHD and explore its contents, you are not able to add any data to this disk. Instead, you add one or more read/write disks to storage and attach the disk(s) to your virtual machine as additional drives.

Understanding Storage

When working with virtual machines in Microsoft Azure Storage, there are three components, as shown in Figure 7:

- **Account.** When you create an account, you associate it with a location or affinity group and specify whether to enable geo-replication.
- **Container.** You can add as many containers as you need to an account, as long as the overall storage requirement does not exceed 100 TB. When you deploy an image from VM Depot,

whether using the CLI or the portal, a container is created automatically for you.

- **Blob.** A VHD is stored as a page blob in blob storage. It can be up to 1 TB in size. You can store as many blobs as you need in a single container, but must remain under the account storage size limit. The VM Depot image deployment process builds the VHD blob automatically for the operating system and maps the VHD as the C drive in your virtual machine. You must then create at least one data disk as a separate VHD, either as an empty drive or by uploading a VHD to blob storage. When you attach the data disk to your virtual machine, you map it to an available drive letter. (The D drive is automatically created with your virtual machine, but uses a shared resource rather than blob storage.)

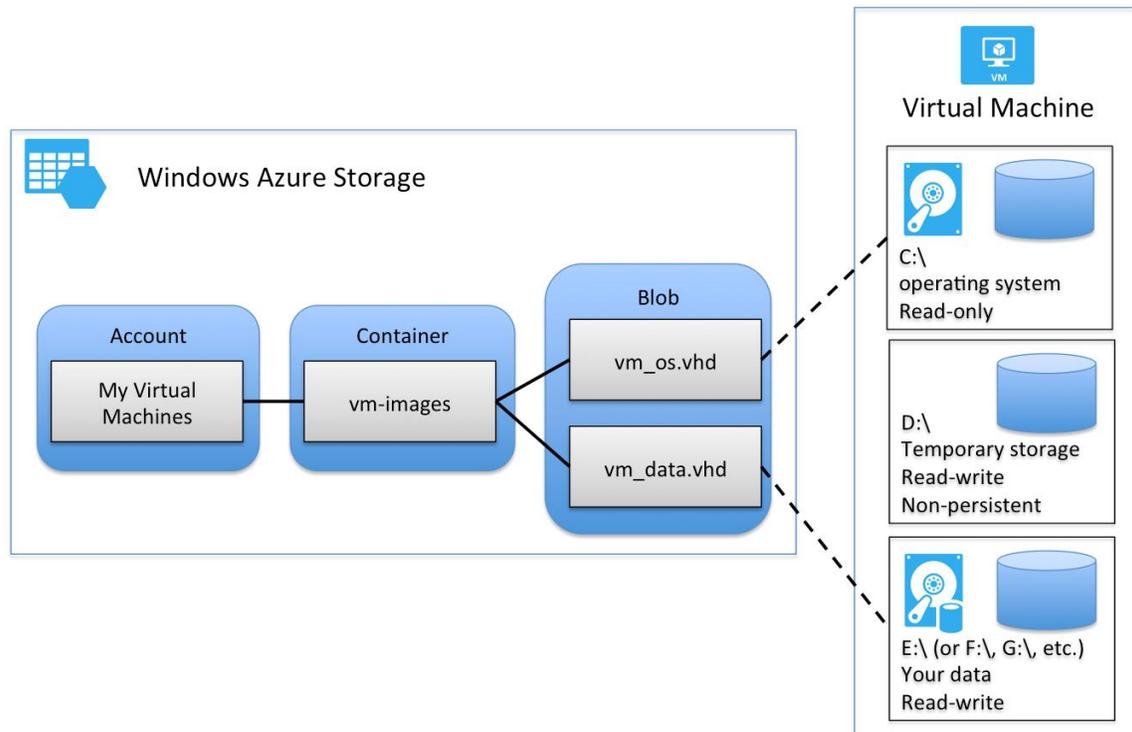


Figure 7: Microsoft Azure Storage Components for a Virtual Machine

Attaching Disks

You can attach an empty disk or an uploaded VHD to which you have preloaded data. If you want to use an empty disk, you can attach it as described later in this section. To upload your own data disk, you have the following options for uploading the data:

- Use one of the available [Azure Storage Explorers](#).
- Use the PowerShell cmdlet [Add-AzureVhd](#).
- Use the CLI command [vm disk create](#).

When you are ready to attach a disk, select your virtual machine in the list of instances in the management portal, click Attach in the command bar, and then click Attach Empty Disk or Attach Disk as appropriate. For an existing disk, you select the disk in storage and specify a Host Cache Preference option. For a new empty disk, a storage location and a file name are automatically assigned, but you can override the file name if you prefer. You must specify a size for the disk in gigabytes, and then select from one of the following Host Cache Preference options:

- **None.** Host caching is disabled. This is the default setting for a data disk.
- **Read Only.** Host caching is enabled only for read operations as a performance optimization.
- **Read Write.** Host caching is enabled for both reads and writes. This is the default setting for an operating system disk.

When an empty disk is attached, you must next initialize the disk by using the Disk Management utility if you are using a Windows virtual machine, and then create a new simple volume. Once the volume is created, the disk is available for use by your applications. If you are using a Linux virtual machine, you use the `fdisk` command to create a new device and a new partition, create a file system on the new partition, add a directory, and then mount the drive.

You can review the steps to attach a data disk for either operating system at <http://azure.microsoft.com/en-us/documentation/articles/storage-windows-attach-disk/>.

Deleting Disks

When you delete a virtual machine, you have the option to delete the corresponding operating system and data disks if you no longer need them. If you might want to assign the disks to a new virtual machine later, you can retain them in storage for future use. However, bear in mind that storage costs accrue for disks that you retain.

You cannot delete a disk that is associated with a virtual machine. To delete a data disk without deleting its virtual machine, you must detach it first. On the Virtual Machines page, select the virtual machine, click the Detach Disk button at the bottom of the page, and select the disk you want to detach. Then go to the Storage page in the portal, click the storage account to which the disk belongs, click the Containers link above the storage list, click the applicable container, select the disk, click the Delete button at the bottom of the page, and then click Yes to confirm.

If you want to delete an operating system disk, you must delete the virtual machine to which it belongs. Select the virtual machine on the Virtual Machines page of the portal, click the Delete button at the bottom of the page, select Delete The Attached Disks, and then click Yes to confirm.

Contributing an Image to VM Depot

If you build a virtual machine based on a Linux distribution and open source applications that would be helpful to the online community, you can contribute it to VM Depot. If you later make changes to your image, such as applying an application upgrade, you can easily update it in VM Depot.

Submitting an Image

Before you can submit an image to VM Depot, you must store a generalized VHD file in a public Microsoft Azure blob. Next, you must sign in to VM Depot. To do this, click the Sign In link on the home page of VM Depot, and then select the desired login option: Windows Live ID, Google, or Yahoo. Depending on your selection and your current login status, you might need to create a profile and accept terms and conditions.

After signing in, click the Publish button at the top of the page. You are then prompted for the details necessary to submit your image, as shown in Figure 8. At minimum, you must supply an image name, provide the URL for the image's blob storage, and specify a supported Linux distribution. You can restrict the image to specific regions or accept the default setting to allow all regions to access your image.

Additionally, you must accept the terms of use to complete the submission. All other fields are optional, but are useful for helping other members of the community find your image and understand its contents.

Publish an Image

Upload thumbnail No file chosen

Image name*

Image legal terms URL

Image description

URL of the VHD file to publish*

Regions* All regions | [Edit](#)

Platform*
 Windows Azure-Endorsed Distributions
The above distributions have been tested and are **currently supported on Windows Azure**.
Please test your image thoroughly before publishing to VM Depot.
 Other Distribution

EndPoints
[Add New EndPoint](#)

Packages, comma-separated

Tags, comma-separated

I agree to the [terms of use](#).*

*Required field

Figure 8: VM Depot Image Submission Details

Managing an Image

After the image is successfully submitted and is published to at least one region, you can click the My Account link in the navigation pane and then click the My Images link. The displayed page provides

commands you use to edit or delete your image. The edit command allows you to modify any field except the image URL. If you want to change the URL for the image, you must delete your image and publish a new one.

If instead you have a new version of your image, you must first add it to blob storage. Then you can replace the existing image in VM Depot by selecting the image in the My Images list and then clicking the Publish Upgrade command. The fields to complete for the upgraded version are similar to the fields required for submitting an image.

References

The following references provide access to information and tools that help you work with VM Depot images:

- [VM Depot Documentation](#)
- [Install and Configure the Microsoft Azure Cross-Platform Command-Line Interface](#)
- [Microsoft Azure Command-Line Tools for Mac and Linux](#)
- [Microsoft Azure Storage Explorers](#)
- [Microsoft Azure PowerShell](#)
- [Microsoft Azure Virtual Machines](#)
- [How to Attach a Data Disk to a Virtual Machine](#)

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