

Table of Contents

[Virtual Machines Documentation](#)

[Linux Virtual Machines](#)

[Windows Virtual Machines](#)

[Linux VMs using classic deployment](#)

[Windows VMs using classic deployment](#)

[Resources](#)

[Azure Roadmap](#)

[Pricing calculator](#)

Learn how to create Azure virtual machines. Tutorials, API references, and other documentation show you how to create and deploy Windows and Linux virtual machines, as well as complex VM templates.

[Getting started with Windows Virtual Machines](#)

[Getting started with Linux Virtual Machines](#)

Azure and Linux

4/9/2018 • 7 min to read • [Edit Online](#)

Microsoft Azure is a growing collection of integrated public cloud services including analytics, Virtual Machines, databases, mobile, networking, storage, and web—ideal for hosting your solutions. Microsoft Azure provides a scalable computing platform that allows you to only pay for what you use, when you want it - without having to invest in on-premises hardware. Azure is ready when you are to scale your solutions up and out to whatever scale you require to service the needs of your clients.

If you are familiar with the various features of Amazon's AWS, you can examine the [Azure vs AWS definition mapping document](#).

Regions

Microsoft Azure resources are distributed across multiple geographical regions around the world. A "region" represents multiple data centers in a single geographical area. Azure currently (as of November 2017) has 36 regions generally available around the world with an additional 6 regions announced. An updated list of existing and newly announced regions can be found in the following page:

- [Azure Regions](#)

Availability

Azure announced an industry leading single instance virtual machine Service Level Agreement of 99.9% provided you deploy the VM with premium storage for all disks. In order for your deployment to qualify for the standard 99.95% VM Service Level Agreement, you still need to deploy two or more VMs running your workload inside of an availability set. An availability set ensures that your VMs are distributed across multiple fault domains in the Azure data centers as well as deployed onto hosts with different maintenance windows. The full [Azure SLA](#) explains the guaranteed availability of Azure as a whole.

Managed Disks

Managed Disks handles Azure Storage account creation and management in the background for you, and ensures that you do not have to worry about the scalability limits of the storage account. You specify the disk size and the performance tier (Standard or Premium), and Azure creates and manages the disk. As you add disks or scale the VM up and down, you don't have to worry about the storage being used. If you're creating new VMs, [use the Azure CLI 2.0](#) or the Azure portal to create VMs with Managed OS and data disks. If you have VMs with unmanaged disks, you can [convert your VMs to be backed with Managed Disks](#).

You can also manage your custom images in one storage account per Azure region, and use them to create hundreds of VMs in the same subscription. For more information about Managed Disks, see the [Managed Disks Overview](#).

Azure Virtual Machines & Instances

Microsoft Azure supports running a number of popular Linux distributions provided and maintained by a number of partners. You can find distributions such as Red Hat Enterprise, CentOS, SUSE Linux Enterprise, Debian, Ubuntu, CoreOS, RancherOS, FreeBSD, and more in the Azure Marketplace. Microsoft actively works with various Linux communities to add even more flavors to the [Azure endorsed Linux Distros](#) list.

If your preferred Linux distro of choice is not currently present in the gallery, you can "Bring your own Linux" VM

by [creating and uploading a Linux VHD in Azure](#).

Azure virtual machines allow you to deploy a wide range of computing solutions in an agile way. You can deploy virtually any workload and any language on nearly any operating system - Windows, Linux, or a custom created one from any one of the growing list of partners. Still don't see what you are looking for? Don't worry - you can also bring your own images from on-premises.

VM Sizes

The [size](#) of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. Azure offers a wide variety of sizes to support many types of uses.

Azure charges an [hourly price](#) based on the VM's size and operating system. For partial hours, Azure charges only for the minutes used. Storage is priced and charged separately.

Automation

To achieve a proper DevOps culture, all infrastructure must be code. When all the infrastructure lives in code it can easily be recreated (Phoenix Servers). Azure works with all the major automation tooling like Ansible, Chef, SaltStack, and Puppet. Azure also has its own tooling for automation:

- [Azure Templates](#)
- [Azure VMAccess](#)

Azure is rolling out support for [cloud-init](#) across most Linux Distros that support it. Currently Canonical's Ubuntu VMs are deployed with cloud-init enabled by default. Red Hat's RHEL, CentOS, and Fedora support cloud-init, however the Azure images maintained by RedHat do not currently have cloud-init installed. To use cloud-init on a RedHat family OS, you must create a custom image with cloud-init installed.

- [Using cloud-init on Azure Linux VMs](#)

Quotas

Each Azure Subscription has default quota limits in place that could impact the deployment of a large number of VMs for your project. The current limit on a per subscription basis is 20 VMs per region. Quota limits can be raised quickly and easily by filing a support ticket requesting a limit increase. For more details on quota limits:

- [Azure Subscription Service Limits](#)

Partners

Microsoft works closely with partners to ensure the images available are updated and optimized for an Azure runtime. For more information on Azure partners, see the following links:

- Linux on Azure - [Endorsed Distributions](#)
- SUSE - [Azure Marketplace - SUSE Linux Enterprise Server](#)
- Redhat - [Azure Marketplace - RedHat Enterprise Linux 7.2](#)
- Canonical - [Azure Marketplace - Ubuntu Server 16.04 LTS](#)
- Debian - [Azure Marketplace - Debian 8 "Jessie"](#)
- FreeBSD - [Azure Marketplace - FreeBSD 10.3](#)
- CoreOS - [Azure Marketplace - CoreOS \(Stable\)](#)
- RancherOS - [Azure Marketplace - RancherOS](#)
- Bitnami - [Bitnami Library for Azure](#)
- Mesosphere - [Azure Marketplace - Mesosphere DC/OS on Azure](#)

- [Docker - Azure Marketplace - Azure Container Service with Docker Swarm](#)
- [Jenkins - Azure Marketplace - CloudBees Jenkins Platform](#)

Getting started with Linux on Azure

To begin using Azure, you need an Azure account, the Azure CLI installed, and a pair of SSH public and private keys.

Sign up for an account

The first step in using the Azure Cloud is to sign up for an Azure account. Go to the [Azure Account Signup](#) page to get started.

Install the CLI

With your new Azure account, you can get started immediately using the Azure portal, which is a web-based admin panel. To manage the Azure Cloud via the command line, you install the `azure-cli`. Install the [Azure CLI 2.0](#) on your Mac or Linux workstation.

Create an SSH key pair

Now you have an Azure account, the Azure web portal, and the Azure CLI. The next step is to create an SSH key pair that is used to SSH into Linux without using a password. [Create SSH keys on Linux and Mac](#) to enable password-less logins and better security.

Create a VM using the CLI

Creating a Linux VM using the CLI is a quick way to deploy a VM without leaving the terminal you are working in. Everything you can specify on the web portal is available via a command-line flag or switch.

- [Create a Linux VM using the CLI](#)

Create a VM in the portal

Creating a Linux VM in the Azure web portal is a way to easily point and click through the various options to get to a deployment. Instead of using command-line flags or switches, you are able to view a nice web layout of various options and settings. Everything available via the command-line interface is also available in the portal.

- [Create a Linux VM using the Portal](#)

Log in using SSH without a password

The VM is now running on Azure and you are ready to log in. Using passwords to log in via SSH is insecure and time consuming. Using SSH keys is the most secure way and also the quickest way to log in. When you create your Linux VM via the portal or the CLI, you have two authentication choices. If you choose a password for SSH, Azure configures the VM to allow logins via passwords. If you chose to use an SSH public key, Azure configures the VM to only allow logins via SSH keys and disables password logins. To secure your Linux VM by only allowing SSH key logins, use the SSH public key option during the VM creation in the portal or CLI.

Related Azure components

Storage

- [Introduction to Microsoft Azure Storage](#)
- [Add a disk to a Linux VM using the azure-cli](#)
- [How to attach a data disk to a Linux VM in the Azure portal](#)

Networking

- [Virtual Network Overview](#)

- [IP addresses in Azure](#)
- [Opening ports to a Linux VM in Azure](#)
- [Create a Fully Qualified Domain Name in the Azure portal](#)

Containers

- [Virtual Machines and Containers in Azure](#)
- [Azure Container Service introduction](#)
- [Deploy an Azure Container Service cluster](#)

Next steps

You now have an overview of Linux on Azure. The next step is to dive in and create a few VMs!

- [Explore the growing list of sample scripts for common tasks via AzureCLI](#)

Overview of Windows virtual machines in Azure

4/9/2018 • 7 min to read • [Edit Online](#)

Azure Virtual Machines (VM) is one of several types of [on-demand, scalable computing resources](#) that Azure offers. Typically, you choose a VM when you need more control over the computing environment than the other choices offer. This article gives you information about what you should consider before you create a VM, how you create it, and how you manage it.

An Azure VM gives you the flexibility of virtualization without having to buy and maintain the physical hardware that runs it. However, you still need to maintain the VM by performing tasks, such as configuring, patching, and installing the software that runs on it.

Azure virtual machines can be used in various ways. Some examples are:

- **Development and test** – Azure VMs offer a quick and easy way to create a computer with specific configurations required to code and test an application.
- **Applications in the cloud** – Because demand for your application can fluctuate, it might make economic sense to run it on a VM in Azure. You pay for extra VMs when you need them and shut them down when you don't.
- **Extended datacenter** – Virtual machines in an Azure virtual network can easily be connected to your organization's network.

The number of VMs that your application uses can scale up and out to whatever is required to meet your needs.

What do I need to think about before creating a VM?

There are always a multitude of [design considerations](#) when you build out an application infrastructure in Azure. These aspects of a VM are important to think about before you start:

- The names of your application resources
- The location where the resources are stored
- The size of the VM
- The maximum number of VMs that can be created
- The operating system that the VM runs
- The configuration of the VM after it starts
- The related resources that the VM needs

Naming

A virtual machine has a [name](#) assigned to it and it has a computer name configured as part of the operating system. The name of a VM can be up to 15 characters.

If you use Azure to create the operating system disk, the computer name and the virtual machine name are the same. If you [upload and use your own image](#) that contains a previously configured operating system and use it to create a virtual machine, the names can be different. We recommend that when you upload your own image file, you make the computer name in the operating system and the virtual machine name the same.

Locations

All resources created in Azure are distributed across multiple [geographical regions](#) around the world. Usually, the region is called **location** when you create a VM. For a VM, the location specifies where the virtual hard disks are stored.

This table shows some of the ways you can get a list of available locations.

METHOD	DESCRIPTION
Azure portal	Select a location from the list when you create a VM.
Azure PowerShell	Use the Get-AzureRmLocation command.
REST API	Use the List locations operation.
Azure CLI	Use the az account list-locations operation.

VM size

The [size](#) of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. Azure offers a wide variety of sizes to support many types of uses.

Azure charges an [hourly price](#) based on the VM's size and operating system. For partial hours, Azure charges only for the minutes used. Storage is priced and charged separately.

VM Limits

Your subscription has default [quota limits](#) in place that could impact the deployment of many VMs for your project. The current limit on a per subscription basis is 20 VMs per region. Limits can be raised by [filing a support ticket requesting an increase](#)

Operating system disks and images

Virtual machines use [virtual hard disks \(VHDs\)](#) to store their operating system (OS) and data. VHDs are also used for the images you can choose from to install an OS.

Azure provides many [marketplace images](#) to use with various versions and types of Windows Server operating systems. Marketplace images are identified by image publisher, offer, sku, and version (typically version is specified as latest).

This table shows some ways that you can find the information for an image.

METHOD	DESCRIPTION
Azure portal	The values are automatically specified for you when you select an image to use.
Azure PowerShell	Get-AzureRMVMImagePublisher -Location "location" Get-AzureRMVMImageOffer -Location "location" -Publisher "publisherName" Get-AzureRMVMImageSku -Location "location" -Publisher "publisherName" -Offer "offerName"
REST APIs	List image publishers List image offers List image skus
Azure CLI	az vm image list-publishers --location "location" az vm image list-offers --location "location" --publisher "publisherName" az vm image list-skus --location "location" --publisher "publisherName" --offer "offerName"

You can choose to [upload and use your own image](#) and when you do, the publisher name, offer, and sku aren't used.

Extensions

VM [extensions](#) give your VM additional capabilities through post deployment configuration and automated tasks.

These common tasks can be accomplished using extensions:

- **Run custom scripts** – The [Custom Script Extension](#) helps you configure workloads on the VM by running your script when the VM is provisioned.
- **Deploy and manage configurations** – The [PowerShell Desired State Configuration \(DSC\) Extension](#) helps you set up DSC on a VM to manage configurations and environments.
- **Collect diagnostics data** – The [Azure Diagnostics Extension](#) helps you configure the VM to collect diagnostics data that can be used to monitor the health of your application.

Related resources

The resources in this table are used by the VM and need to exist or be created when the VM is created.

RESOURCE	REQUIRED	DESCRIPTION
Resource group	Yes	The VM must be contained in a resource group.
Storage account	Yes	The VM needs the storage account to store its virtual hard disks.
Virtual network	Yes	The VM must be a member of a virtual network.
Public IP address	No	The VM can have a public IP address assigned to it to remotely access it.
Network interface	Yes	The VM needs the network interface to communicate in the network.
Data disks	No	The VM can include data disks to expand storage capabilities.

How do I create my first VM?

You have several choices for creating your VM. The choice that you make depends on the environment you are in.

This table provides information to get you started creating your VM.

METHOD	ARTICLE
Azure portal	Create a virtual machine running Windows using the portal
Templates	Create a Windows virtual machine with a Resource Manager template
Azure PowerShell	Create a Windows VM using PowerShell
Client SDKs	Deploy Azure Resources using C#

METHOD	ARTICLE
REST APIs	Create or update a VM
Azure CLI	Create a VM with the Azure CLI

You hope it never happens, but occasionally something goes wrong. If this situation happens to you, look at the information in [Troubleshoot Resource Manager deployment issues with creating a Windows virtual machine in Azure](#).

How do I manage the VM that I created?

VMs can be managed using a browser-based portal, command-line tools with support for scripting, or directly through APIs. Some typical management tasks that you might perform are getting information about a VM, logging on to a VM, managing availability, and making backups.

Get information about a VM

This table shows you some of the ways that you can get information about a VM.

METHOD	DESCRIPTION
Azure portal	On the hub menu, click Virtual Machines and then select the VM from the list. On the blade for the VM, you have access to overview information, setting values, and monitoring metrics.
Azure PowerShell	For information about using PowerShell to manage VMs, see Create and manage Windows VMs with the Azure PowerShell module .
REST API	Use the Get VM information operation to get information about a VM.
Client SDKs	For information about using C# to manage VMs, see Manage Azure Virtual Machines using Azure Resource Manager and C# .
Azure CLI	For information about using Azure CLI to manage VMs, see Azure CLI Reference .

Log on to the VM

You use the Connect button in the Azure portal to [start a Remote Desktop \(RDP\) session](#). Things can sometimes go wrong when trying to use a remote connection. If this situation happens to you, check out the help information in [Troubleshoot Remote Desktop connections to an Azure virtual machine running Windows](#).

Manage availability

It's important for you to understand how to [ensure high availability](#) for your application. This configuration involves creating multiple VMs to ensure that at least one is running.

In order for your deployment to qualify for our 99.95 VM Service Level Agreement, you need to deploy two or more VMs running your workload inside an [availability set](#). This configuration ensures your VMs are distributed across multiple fault domains and are deployed onto hosts with different maintenance windows. The full [Azure SLA](#) explains the guaranteed availability of Azure as a whole.

Back up the VM

A [Recovery Services vault](#) is used to protect data and assets in both Azure Backup and Azure Site Recovery

services. You can use a Recovery Services vault to [deploy and manage backups for Resource Manager-deployed VMs using PowerShell](#).

Next steps

- If your intent is to work with Linux VMs, look at [Azure and Linux](#).
- Learn more about the guidelines around setting up your infrastructure in the [Example Azure infrastructure walkthrough](#).

Azure and Linux

4/9/2018 • 7 min to read • [Edit Online](#)

Microsoft Azure is a growing collection of integrated public cloud services including analytics, Virtual Machines, databases, mobile, networking, storage, and web—ideal for hosting your solutions. Microsoft Azure provides a scalable computing platform that allows you to only pay for what you use, when you want it - without having to invest in on-premises hardware. Azure is ready when you are to scale your solutions up and out to whatever scale you require to service the needs of your clients.

If you are familiar with the various features of Amazon's AWS, you can examine the [Azure vs AWS definition mapping document](#).

Regions

Microsoft Azure resources are distributed across multiple geographical regions around the world. A "region" represents multiple data centers in a single geographical area. Azure currently (as of November 2017) has 36 regions generally available around the world with an additional 6 regions announced. An updated list of existing and newly announced regions can be found in the following page:

- [Azure Regions](#)

Availability

Azure announced an industry leading single instance virtual machine Service Level Agreement of 99.9% provided you deploy the VM with premium storage for all disks. In order for your deployment to qualify for the standard 99.95% VM Service Level Agreement, you still need to deploy two or more VMs running your workload inside of an availability set. An availability set ensures that your VMs are distributed across multiple fault domains in the Azure data centers as well as deployed onto hosts with different maintenance windows. The full [Azure SLA](#) explains the guaranteed availability of Azure as a whole.

Managed Disks

Managed Disks handles Azure Storage account creation and management in the background for you, and ensures that you do not have to worry about the scalability limits of the storage account. You specify the disk size and the performance tier (Standard or Premium), and Azure creates and manages the disk. As you add disks or scale the VM up and down, you don't have to worry about the storage being used. If you're creating new VMs, [use the Azure CLI 2.0](#) or the Azure portal to create VMs with Managed OS and data disks. If you have VMs with unmanaged disks, you can [convert your VMs to be backed with Managed Disks](#).

You can also manage your custom images in one storage account per Azure region, and use them to create hundreds of VMs in the same subscription. For more information about Managed Disks, see the [Managed Disks Overview](#).

Azure Virtual Machines & Instances

Microsoft Azure supports running a number of popular Linux distributions provided and maintained by a number of partners. You can find distributions such as Red Hat Enterprise, CentOS, SUSE Linux Enterprise, Debian, Ubuntu, CoreOS, RancherOS, FreeBSD, and more in the Azure Marketplace. Microsoft actively works with various Linux communities to add even more flavors to the [Azure endorsed Linux Distros](#) list.

If your preferred Linux distro of choice is not currently present in the gallery, you can "Bring your own Linux" VM

by [creating and uploading a Linux VHD in Azure](#).

Azure virtual machines allow you to deploy a wide range of computing solutions in an agile way. You can deploy virtually any workload and any language on nearly any operating system - Windows, Linux, or a custom created one from any one of the growing list of partners. Still don't see what you are looking for? Don't worry - you can also bring your own images from on-premises.

VM Sizes

The [size](#) of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. Azure offers a wide variety of sizes to support many types of uses.

Azure charges an [hourly price](#) based on the VM's size and operating system. For partial hours, Azure charges only for the minutes used. Storage is priced and charged separately.

Automation

To achieve a proper DevOps culture, all infrastructure must be code. When all the infrastructure lives in code it can easily be recreated (Phoenix Servers). Azure works with all the major automation tooling like Ansible, Chef, SaltStack, and Puppet. Azure also has its own tooling for automation:

- [Azure Templates](#)
- [Azure VMAccess](#)

Azure is rolling out support for [cloud-init](#) across most Linux Distros that support it. Currently Canonical's Ubuntu VMs are deployed with cloud-init enabled by default. Red Hat's RHEL, CentOS, and Fedora support cloud-init, however the Azure images maintained by RedHat do not currently have cloud-init installed. To use cloud-init on a RedHat family OS, you must create a custom image with cloud-init installed.

- [Using cloud-init on Azure Linux VMs](#)

Quotas

Each Azure Subscription has default quota limits in place that could impact the deployment of a large number of VMs for your project. The current limit on a per subscription basis is 20 VMs per region. Quota limits can be raised quickly and easily by filing a support ticket requesting a limit increase. For more details on quota limits:

- [Azure Subscription Service Limits](#)

Partners

Microsoft works closely with partners to ensure the images available are updated and optimized for an Azure runtime. For more information on Azure partners, see the following links:

- Linux on Azure - [Endorsed Distributions](#)
- SUSE - [Azure Marketplace - SUSE Linux Enterprise Server](#)
- Redhat - [Azure Marketplace - RedHat Enterprise Linux 7.2](#)
- Canonical - [Azure Marketplace - Ubuntu Server 16.04 LTS](#)
- Debian - [Azure Marketplace - Debian 8 "Jessie"](#)
- FreeBSD - [Azure Marketplace - FreeBSD 10.3](#)
- CoreOS - [Azure Marketplace - CoreOS \(Stable\)](#)
- RancherOS - [Azure Marketplace - RancherOS](#)
- Bitnami - [Bitnami Library for Azure](#)
- Mesosphere - [Azure Marketplace - Mesosphere DC/OS on Azure](#)

- Docker - [Azure Marketplace - Azure Container Service with Docker Swarm](#)
- Jenkins - [Azure Marketplace - CloudBees Jenkins Platform](#)

Getting started with Linux on Azure

To begin using Azure, you need an Azure account, the Azure CLI installed, and a pair of SSH public and private keys.

Sign up for an account

The first step in using the Azure Cloud is to sign up for an Azure account. Go to the [Azure Account Signup](#) page to get started.

Install the CLI

With your new Azure account, you can get started immediately using the Azure portal, which is a web-based admin panel. To manage the Azure Cloud via the command line, you install the `azure-cli`. Install the [Azure CLI 2.0](#) on your Mac or Linux workstation.

Create an SSH key pair

Now you have an Azure account, the Azure web portal, and the Azure CLI. The next step is to create an SSH key pair that is used to SSH into Linux without using a password. [Create SSH keys on Linux and Mac](#) to enable password-less logins and better security.

Create a VM using the CLI

Creating a Linux VM using the CLI is a quick way to deploy a VM without leaving the terminal you are working in. Everything you can specify on the web portal is available via a command-line flag or switch.

- [Create a Linux VM using the CLI](#)

Create a VM in the portal

Creating a Linux VM in the Azure web portal is a way to easily point and click through the various options to get to a deployment. Instead of using command-line flags or switches, you are able to view a nice web layout of various options and settings. Everything available via the command-line interface is also available in the portal.

- [Create a Linux VM using the Portal](#)

Log in using SSH without a password

The VM is now running on Azure and you are ready to log in. Using passwords to log in via SSH is insecure and time consuming. Using SSH keys is the most secure way and also the quickest way to log in. When you create your Linux VM via the portal or the CLI, you have two authentication choices. If you choose a password for SSH, Azure configures the VM to allow logins via passwords. If you chose to use an SSH public key, Azure configures the VM to only allow logins via SSH keys and disables password logins. To secure your Linux VM by only allowing SSH key logins, use the SSH public key option during the VM creation in the portal or CLI.

Related Azure components

Storage

- [Introduction to Microsoft Azure Storage](#)
- [Add a disk to a Linux VM using the azure-cli](#)
- [How to attach a data disk to a Linux VM in the Azure portal](#)

Networking

- [Virtual Network Overview](#)

- [IP addresses in Azure](#)
- [Opening ports to a Linux VM in Azure](#)
- [Create a Fully Qualified Domain Name in the Azure portal](#)

Containers

- [Virtual Machines and Containers in Azure](#)
- [Azure Container Service introduction](#)
- [Deploy an Azure Container Service cluster](#)

Next steps

You now have an overview of Linux on Azure. The next step is to dive in and create a few VMs!

- [Explore the growing list of sample scripts for common tasks via AzureCLI](#)

Overview of Windows virtual machines in Azure

4/9/2018 • 7 min to read • [Edit Online](#)

Azure Virtual Machines (VM) is one of several types of [on-demand, scalable computing resources](#) that Azure offers. Typically, you choose a VM when you need more control over the computing environment than the other choices offer. This article gives you information about what you should consider before you create a VM, how you create it, and how you manage it.

An Azure VM gives you the flexibility of virtualization without having to buy and maintain the physical hardware that runs it. However, you still need to maintain the VM by performing tasks, such as configuring, patching, and installing the software that runs on it.

Azure virtual machines can be used in various ways. Some examples are:

- **Development and test** – Azure VMs offer a quick and easy way to create a computer with specific configurations required to code and test an application.
- **Applications in the cloud** – Because demand for your application can fluctuate, it might make economic sense to run it on a VM in Azure. You pay for extra VMs when you need them and shut them down when you don't.
- **Extended datacenter** – Virtual machines in an Azure virtual network can easily be connected to your organization's network.

The number of VMs that your application uses can scale up and out to whatever is required to meet your needs.

What do I need to think about before creating a VM?

There are always a multitude of [design considerations](#) when you build out an application infrastructure in Azure. These aspects of a VM are important to think about before you start:

- The names of your application resources
- The location where the resources are stored
- The size of the VM
- The maximum number of VMs that can be created
- The operating system that the VM runs
- The configuration of the VM after it starts
- The related resources that the VM needs

Naming

A virtual machine has a [name](#) assigned to it and it has a computer name configured as part of the operating system. The name of a VM can be up to 15 characters.

If you use Azure to create the operating system disk, the computer name and the virtual machine name are the same. If you [upload and use your own image](#) that contains a previously configured operating system and use it to create a virtual machine, the names can be different. We recommend that when you upload your own image file, you make the computer name in the operating system and the virtual machine name the same.

Locations

All resources created in Azure are distributed across multiple [geographical regions](#) around the world. Usually, the region is called **location** when you create a VM. For a VM, the location specifies where the virtual hard disks are stored.

This table shows some of the ways you can get a list of available locations.

METHOD	DESCRIPTION
Azure portal	Select a location from the list when you create a VM.
Azure PowerShell	Use the Get-AzureRmLocation command.
REST API	Use the List locations operation.
Azure CLI	Use the az account list-locations operation.

VM size

The [size](#) of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. Azure offers a wide variety of sizes to support many types of uses.

Azure charges an [hourly price](#) based on the VM's size and operating system. For partial hours, Azure charges only for the minutes used. Storage is priced and charged separately.

VM Limits

Your subscription has default [quota limits](#) in place that could impact the deployment of many VMs for your project. The current limit on a per subscription basis is 20 VMs per region. Limits can be raised by [filing a support ticket requesting an increase](#)

Operating system disks and images

Virtual machines use [virtual hard disks \(VHDs\)](#) to store their operating system (OS) and data. VHDs are also used for the images you can choose from to install an OS.

Azure provides many [marketplace images](#) to use with various versions and types of Windows Server operating systems. Marketplace images are identified by image publisher, offer, sku, and version (typically version is specified as latest).

This table shows some ways that you can find the information for an image.

METHOD	DESCRIPTION
Azure portal	The values are automatically specified for you when you select an image to use.
Azure PowerShell	Get-AzureRMVMImagePublisher -Location "location" Get-AzureRMVMImageOffer -Location "location" -Publisher "publisherName" Get-AzureRMVMImageSku -Location "location" -Publisher "publisherName" -Offer "offerName"
REST APIs	List image publishers List image offers List image skus
Azure CLI	az vm image list-publishers --location "location" az vm image list-offers --location "location" --publisher "publisherName" az vm image list-skus --location "location" --publisher "publisherName" --offer "offerName"

You can choose to [upload and use your own image](#) and when you do, the publisher name, offer, and sku aren't used.

Extensions

VM [extensions](#) give your VM additional capabilities through post deployment configuration and automated tasks.

These common tasks can be accomplished using extensions:

- **Run custom scripts** – The [Custom Script Extension](#) helps you configure workloads on the VM by running your script when the VM is provisioned.
- **Deploy and manage configurations** – The [PowerShell Desired State Configuration \(DSC\) Extension](#) helps you set up DSC on a VM to manage configurations and environments.
- **Collect diagnostics data** – The [Azure Diagnostics Extension](#) helps you configure the VM to collect diagnostics data that can be used to monitor the health of your application.

Related resources

The resources in this table are used by the VM and need to exist or be created when the VM is created.

RESOURCE	REQUIRED	DESCRIPTION
Resource group	Yes	The VM must be contained in a resource group.
Storage account	Yes	The VM needs the storage account to store its virtual hard disks.
Virtual network	Yes	The VM must be a member of a virtual network.
Public IP address	No	The VM can have a public IP address assigned to it to remotely access it.
Network interface	Yes	The VM needs the network interface to communicate in the network.
Data disks	No	The VM can include data disks to expand storage capabilities.

How do I create my first VM?

You have several choices for creating your VM. The choice that you make depends on the environment you are in.

This table provides information to get you started creating your VM.

METHOD	ARTICLE
Azure portal	Create a virtual machine running Windows using the portal
Templates	Create a Windows virtual machine with a Resource Manager template
Azure PowerShell	Create a Windows VM using PowerShell
Client SDKs	Deploy Azure Resources using C#

METHOD	ARTICLE
REST APIs	Create or update a VM
Azure CLI	Create a VM with the Azure CLI

You hope it never happens, but occasionally something goes wrong. If this situation happens to you, look at the information in [Troubleshoot Resource Manager deployment issues with creating a Windows virtual machine in Azure](#).

How do I manage the VM that I created?

VMs can be managed using a browser-based portal, command-line tools with support for scripting, or directly through APIs. Some typical management tasks that you might perform are getting information about a VM, logging on to a VM, managing availability, and making backups.

Get information about a VM

This table shows you some of the ways that you can get information about a VM.

METHOD	DESCRIPTION
Azure portal	On the hub menu, click Virtual Machines and then select the VM from the list. On the blade for the VM, you have access to overview information, setting values, and monitoring metrics.
Azure PowerShell	For information about using PowerShell to manage VMs, see Create and manage Windows VMs with the Azure PowerShell module .
REST API	Use the Get VM information operation to get information about a VM.
Client SDKs	For information about using C# to manage VMs, see Manage Azure Virtual Machines using Azure Resource Manager and C# .
Azure CLI	For information about using Azure CLI to manage VMs, see Azure CLI Reference .

Log on to the VM

You use the Connect button in the Azure portal to [start a Remote Desktop \(RDP\) session](#). Things can sometimes go wrong when trying to use a remote connection. If this situation happens to you, check out the help information in [Troubleshoot Remote Desktop connections to an Azure virtual machine running Windows](#).

Manage availability

It's™ important for you to understand how to [ensure high availability](#) for your application. This configuration involves creating multiple VMs to ensure that at least one is running.

In order for your deployment to qualify for our 99.95 VM Service Level Agreement, you need to deploy two or more VMs running your workload inside an [availability set](#). This configuration ensures your VMs are distributed across multiple fault domains and are deployed onto hosts with different maintenance windows. The full [Azure SLA](#) explains the guaranteed availability of Azure as a whole.

Back up the VM

A [Recovery Services vault](#) is used to protect data and assets in both Azure Backup and Azure Site Recovery

services. You can use a Recovery Services vault to [deploy and manage backups for Resource Manager-deployed VMs using PowerShell](#).

Next steps

- If your intent is to work with Linux VMs, look at [Azure and Linux](#).
- Learn more about the guidelines around setting up your infrastructure in the [Example Azure infrastructure walkthrough](#).