Red Hat

Microsoft Azure

User guide:
Red Hat Enterprise Linux
on Microsoft Azure

Get the most out of Red Hat
Enterprise Linux on Microsoft Azure

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In this user guide, we offer tips to effectively set up Red Hat® Enterprise Linux® on Microsoft Azure, and provide a few pointers for how to maximize the value of your Red Hat Enterprise Linux subscription. This guide will help you avoid pitfalls in the process of purchasing, deploying, configuring, and managing Red Hat Enterprise Linux instances on Microsoft Azure, whether you are moving existing workloads to a cloud environment, or just getting started.

What is Red Hat Enterprise Linux on Microsoft Azure?

There are a few different ways to purchase Red Hat Enterprise Linux on Azure:

1. Purchase a subscription via the Azure Marketplace, for pay-as-you-go (PAYG), or a 1 or 3 year term.

2. Purchase a subscription from Red Hat or via a Red Hat partner. If this is a migration scenario you can move it to Microsoft Azure using Red Hat Cloud Access, which is also known as bring-your-own-subscription (BYOS). Additionally, deploy your own image or a gold image as a virtual machine (VM).

Each of these methods comes with different mechanisms for provisioning the underlying VM. Typically, marketplace customers will provision using the Microsoft Azure console or az command line, whereas Red Hat Cloud Access customers will use one of the various options to provision using one of the gold image options.

Either of these methods is valid and result in a Red Hat Enterprise Linux instance that allows for the same access to updates from Red Hat. However, VMs provisioned through the Azure Marketplace come preconfigured to use Azure-hosted Red Hat Update Infrastructure, while VMs provisioned through BYOS need to be connected to Red Hat Subscription Management or Red Hat Satellite.

You should be deliberate and purposeful about which one you choose, as they are intended for different use cases, which we cover below.

Why run Red Hat Enterprise Linux on Microsoft Azure?

Running Red Hat Enterprise Linux on Microsoft Azure offers several benefits, including enhanced scalability, flexibility, cost-efficiency, and access to a wide range of managed services. By using Microsoft Azure's global infrastructure, you can scale your Red Hat Enterprise Linux workloads to meet changing demands, reduce capital expenditure, and take advantage of various purchase models.

Benefit from the full power of an enterprise OS

Tap into the power of Red Hat Enterprise Linux

A subscription to Red Hat Enterprise Linux offers more than just access to the operating system (OS). There are numerous additional benefits, including:

▸ Red Hat's extensive partner ecosystem with more than 5,200 hardware providers, 4,900 software providers, and 1,400 cloud and service providers.

▸ Coordinated support between Red Hat and your cloud provider with 24x7 support.

▸ A supported migration tool, Convert2RHEL, for streamlined migration from other downstream derivatives distributions such as CentOS Linux, Oracle Linux and others while maintaining existing customizations, configurations, and preferences.

▸ Red Hat Insights, a robust service for visibility, analysis, and remediation across your Red Hat environment on-premise and in cloud from a single console.

Insights helps you run Red Hat Enterprise Linux as a single platform

Red Hat Insights comes at no extra cost with Red Hat Enterprise Linux and can bolster the OS's capabilities as a unified platform across clouds and on-premise:

1. **Visibility.** Insights simplifies management and monitoring with a comprehensive view of your entire Red Hat Enterprise Linux estate.

2. **Proactive alerts.** Insights proactively alerts administrators and stakeholders before an outage or security event occurs.

3. **Drift analysis.** Insights analyzes data across all footprints, highlighting performance patterns and configuration drift that could impact application performance.

4. **Compliance.** Insights monitors systems against industry standards, helping you to maintain compliance, and assisting your efforts to improve your security posture.

Insights streamlines Red Hat Enterprise Linux management across diverse deployments, creating a consistent experience no matter where you install it, which is especially useful if you still have some of your workloads running on-premise in addition to those running on Microsoft Azure.

This functionality is accessed through [Red Hat Hybrid Cloud Console](). You will need to make sure your Microsoft Azure account and your Red Hat account are connected and you are signed up for Insights. If you signed up for Red Hat Enterprise Linux through hourly images on the Azure Marketplace, this connection might not be automatic.

Questions to answer before you begin

What is the use case for your deployment of Red Hat Enterprise Linux?

How you deploy your Red Hat Enterprise Linux instance on Microsoft Azure depends on your use case. Ask yourself:

1. Do I want to use my own subscription or buy a new subscription from the Azure Marketplace?

   1.1 Will this be a long running workload, needing a yearly subscription, or a short-lived workload needing PAYG?

2. Do I want to use a standard image in Azure and build from that, or upload my own image?

3. How will this machine be updated? If your answer is the Azure marketplace, use Red Hat Update Infrastructure, but if your answer is BYOS, ask yourself how you would connect to subscription management.

A critical workload expected to run continuously for extended periods of time requires a persistent, stable, and highly available cloud infrastructure. Workloads that exhibit seasonal variance—experiencing high demand during certain periods and low demand during others—would also benefit from a cloud environment's elasticity. This allows for rapid scaling up of resources during peak times and scaling down during off-peak periods, optimizing cost efficiency. These different use cases suggest different deployment models.

What is the most appropriate deployment model?

When choosing a deployment model, payment preference should be considered. Both an annual subscription and PAYG (usage-based) options have advantages and disadvantages, and the ideal choice largely depends on your specific requirements, budget constraints, and anticipated workload patterns. If budget predictability and simplified billing are paramount, a monthly or yearly rate may be most suitable. Conversely, if flexibility, cost-efficiency, and the ability to rapidly scale are essential, a usage-based model might be a better option.

Annual subscription

An annual subscription provides budget predictability, simplified billing, and generally a more competitive price for committing to longer-term plans. A fixed rate also eliminates the need for close usage monitoring. Subscriptions are available through your Red Hat account manager or a certified Red Hat partner. You may also qualify for the Red Hat Hybrid Committed Spend program which spans across clouds and on-premise environments. Annual subscriptions can also qualify toward the Microsoft Azure committed spend program, Microsoft Azure Consumption Commitment (MACC), if procured through Azure Marketplace.

PAYG

This payment option provides enhanced flexibility, freedom from longer-term commitments, and qualifies for MACC. This usage-based approach ensures you only pay for the resources you use, allowing for optimal cost allocation and rapid scaling in response to demand fluctuations. However, this model can result in unpredictable costs and necessitate continuous usage monitoring to prevent overruns.

How do I switch payment models later?

If you commit to one type of payment model and your business needs change so that the other model is now more appropriate, there are 2 methods to do so.

Switching from PAYG to 1-year or 3-year plans using Azure Reserved Virtual Machine Instances

You can switch from PAYG to fixed term plans using Azure Reserved Virtual Machine Instances. This does not change your existing VMs directly, but applies a reservation discount to match the usage of running VMs.

Switching from PAYG to BYOS using Azure Hybrid Benefit

Switching from a PAYG VM from the Azure Marketplace to a BYOS model on a fixed term using Azure Hybrid Benefit involves converting your existing VM to use your own Red Hat Enterprise Linux subscription. This is a more permanent change to your VMs.

What do you need to get started?

After you have chosen the deployment and payment options that work best for your organization, you need 2 things to get started: a Microsoft Azure account and your Red Hat account. If you do not have one of those or the other, set them up before you begin.
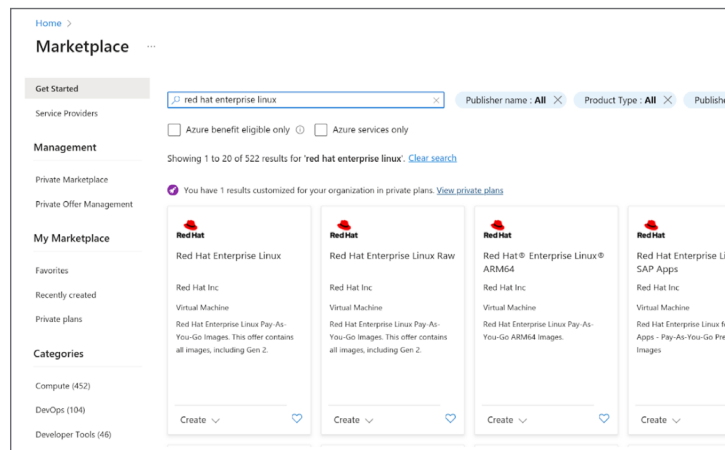
Deploying Red Hat Enterprise Linux on Microsoft Azure

Just as there are various ways to pay for Red Hat Enterprise Linux on Microsoft Azure, there are various ways to deploy an instance there as well.

Setting up Red Hat Enterprise Linux purchased through the Azure Marketplace

1. **Sign in:** Sign into the Azure Marketplace. Search for "Red Hat Enterprise Linux."

2. **Choose an offering:** Select between the different Red Hat Enterprise Linux offerings:
    - **Red Hat Enterprise Linux** comes with its Logical Volume Manager (LVM) configured.
        - The "latest minor version" is a rolling release of the latest version.
        - Lower numbered point releases require manual intervention to version hop.
    - **Red Hat Enterprise Linux Raw** comes with a RAW disk (and no LVM configured).
    - **Red Hat Enterprise Linux ARM64** is for ARM64 processors unlike the others, which are for x86_64 processors.
    - **Red Hat Enterprise Linux for SAP** has specific uses which are outlined more thoroughly here.

3. **Create a virtual machine (VM):**
   - Click on "Create a resource" > "Compute" > "Virtual Machine."
   - Fill in the required fields such as Subscription, Resource Group, VM name, Region.
   - Under the "Image" dropdown, select the version of Red Hat Enterprise Linux you are using.

4. **Choose a provisioning agent:** Select between using **cloud-init**, or the **WALA** agent for provisioning customization.
   - **WALA** is an Azure platform-specific agent used to provision and configure VMs, and handle Azure extensions. The WALA agent is simpler to use and is tightly integrated with Azure.
   - **cloud-init** is a non-Azure specific agent that does not interact with Azure extensions. The cloud-init agent uses a broader standard and has more flexibility, extensibility, and active development, but is more complex to use and is not directly integrated into Azure.

5. **Choose a boot type:** Choose between Gen1 (BIOS) or Gen2 (UEFI) boot.
   - **BIOS** is older, has greater backward compatibility.
   - **UEFI** is newer, boots faster, and has more compatibility with newer technologies.

6. **Connect to your VM:** Go to your VM overview page and click "connect to SSH" into your instance.

Installing a previously deployed on-premise Red Hat Enterprise Linux instance
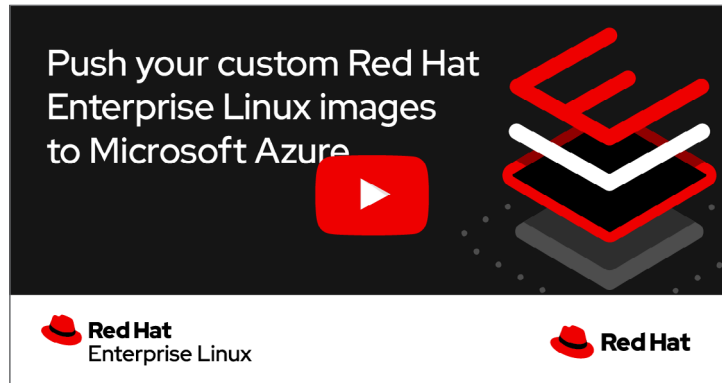
Transferring from a previously deployed on-premise Red Hat Enterprise Linux instance requires a few additional steps before you do the setup in the previous section. Before you start, you should also assess plans around downtime and data transfer costs.

NOTE: This is working from the assumption you are moving from a virtualized environment. If your on-premise instance was running on bare metal, this process might have additional steps that are not included here.

1. **Make a backup:** Making a backup is a critical step of this procedure. You will be making core changes to your system, and a good backup may be your only recovery method if things do not go as planned.

2. **Create a disk image of the on-premise instance:** Save this disk image to a file.
    a. If you are able to stop the server, you can create the image using "dd" by following the instructions.
    b. If you are unable to stop the server, you can create the image using Logical volume management (LVM).

3. **Upload the disk image to Azure Blob Storage:**
    a. Sign in to the Azure Portal.
    b. Navigate to "Storage accounts" and create a new storage account or use an existing one.
    c. Inside the storage account, create a Blob container.
    d. Upload the disk image file to this Blob container.

4. **Create a Managed Disk from the disk image**
    a. In the Azure Portal, navigate to "Disks" under "Compute."
    b. Click on "Create" and select the option to create a disk from a Blob.
    c. Point it to the Blob where you uploaded your disk image.

5. **Create a VM from the Managed Disk**
    a. Still in the Azure Portal, navigate to "Virtual Machines."
    b. Click on "Create" and then select the option to create a VM from a managed disk.
    c. Make sure to specify the correct settings that match your on-premise deployment, such as VM size, networking options, etc.

6. **Launch the VM:** Once your managed disk is ready, you can create a new VM from it. From there, the process is similar to creating any other Azure VM. Configure the VM details, add storage if needed, configure networking, review, and then create the VM.

7. **Configure to match your on-premise deployment:** Once your instance is running, you may need to perform additional configuration. Connect to the instance and check everything is running as expected. You may need to do updates, change configurations, or make other changes to match the on-premise instance.

Red Hat Enterprise Linux on Microsoft Azure provides flexibility when it comes to deploying in the cloud.

[Learn more](#) **about the specific technical processes for setting up Red Hat Enterprise Linux on Microsoft Azure.**

About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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