Introduction

- 1 minute

In this module, you'll be introduced to factors that impact costs in Azure and tools to help you both predict potential costs and monitor and control costs.

Learning objectives

After completing this module, you'll be able to:

- Describe factors that can affect costs in Azure.
- Compare the Pricing calculator and Total Cost of Ownership (TCO) calculator.
- Describe Azure Cost Management Tool.
- Describe the purpose of tags.

Next unit: Describe factors that can affect costs in Azure

Continue

Describe factors that can affect costs in Azure

- 7 minutes

The following video provides an introduction to things that can impact your costs in Azure.

https://learn.microsoft.com/en-us/training/modules/describe-cost-management-azure/2-describe-factors-affect-costs-azure

Azure shifts development costs from the capital expense (CapEx) of building out and maintaining infrastructure and facilities to an operational expense (OpEx) of renting infrastructure as you need it, whether it's compute, storage, networking, and so on.

That OpEx cost can be impacted by many factors. Some of the impacting factors are:

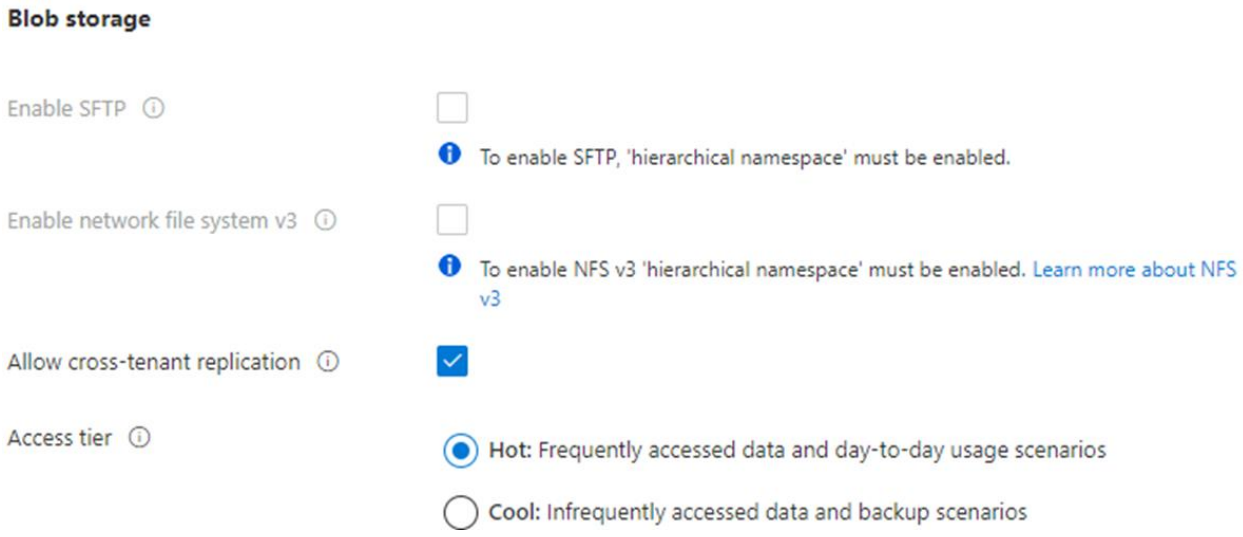
- Resource type
- Consumption
- Maintenance
- Geography
- Subscription type
- Azure Marketplace

Resource type

A number of factors influence the cost of Azure resources. The type of resources, the settings for the resource, and the Azure region will all have an impact on how much a resource costs. When you provision an Azure resource, Azure creates metered instances for that resource. The meters track the resources' usage and generate a usage record that is used to calculate your bill.

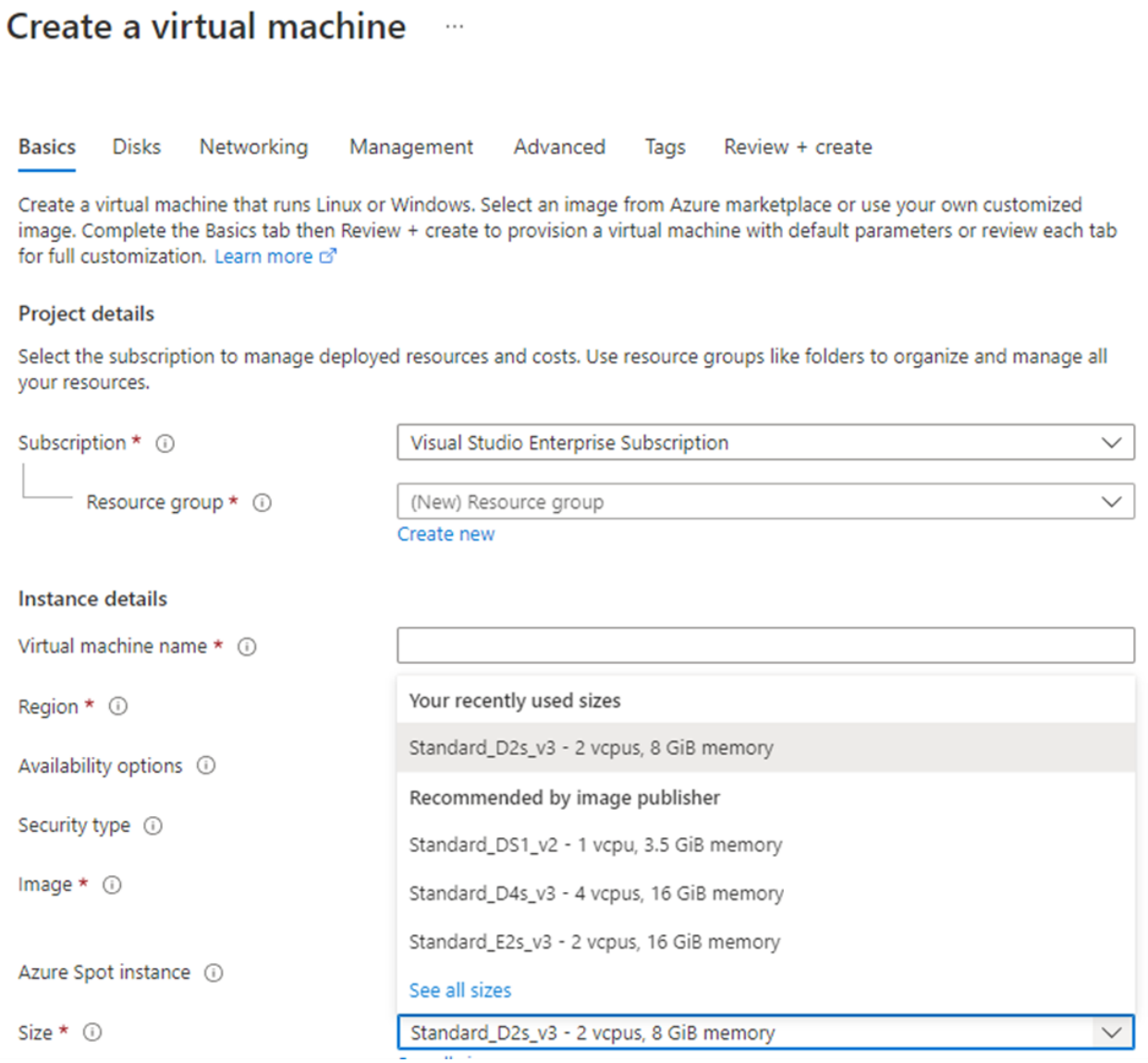
Examples

With a storage account, you specify a type such as blob, a performance tier, an access tier, redundancy settings, and a region. Creating the same storage account in different regions may show different costs and changing any of the settings may also impact the price.



With a virtual machine (VM), you may have to consider licensing for the operating system or other software, the processor and number of cores for the VM, the attached

storage, and the network interface. Just like with storage, provisioning the same virtual machine in different regions may result in different costs.



Consumption

Pay-as-you-go has been a consistent theme throughout, and that's the cloud payment model where you pay for the resources that you use during a billing cycle. If you use more compute this cycle, you pay more. If you use less in the current cycle, you pay less. It's a straight forward pricing mechanism that allows for maximum flexibility.

However, Azure also offers the ability to commit to using a set amount of cloud resources in advance and receiving discounts on those "reserved" resources. Many

services, including databases, compute, and storage all provide the option to commit to a level of use and receive a discount, in some cases up to 72 percent.

When you reserve capacity, you're committing to using and paying for a certain amount of Azure resources during a given period (typically one or three years). With the back-up of pay-as-you-go, if you see a sudden surge in demand that eclipses what you've pre-reserved, you just pay for the additional resources in excess of your reservation. This model allows you to recognize significant savings on reliable, consistent workloads while also having the flexibility to rapidly increase your cloud footprint as the need arises.

Maintenance

The flexibility of the cloud makes it possible to rapidly adjust resources based on demand. Using resource groups can help keep all of your resources organized. In order to control costs, it's important to maintain your cloud environment. For example, every time you provision a VM, additional resources such as storage and networking are also provisioned. If you deprovision the VM, those additional resources may not deprovision at the same time, either intentionally or unintentionally. By keeping an eye on your resources and making sure you're not keeping around resources that are no longer needed, you can help control cloud costs.

Geography

When you provision most resources in Azure, you need to define a region where the resource deploys. Azure infrastructure is distributed globally, which enables you to deploy your services centrally or closest to your customers, or something in between. With this global deployment comes global pricing differences. The cost of power, labor, taxes, and fees vary depending on the location. Due to these variations, Azure resources can differ in costs to deploy depending on the region.

Network traffic is also impacted based on geography. For example, it's less expensive to move information within Europe than to move information from Europe to Asia or South America.

Network Traffic

Billing zones are a factor in determining the cost of some Azure services.

Bandwidth refers to data moving in and out of Azure datacenters. Some inbound data transfers (data going into Azure datacenters) are free. For outbound data transfers (data leaving Azure datacenters), data transfer pricing is based on zones.

A zone is a geographical grouping of Azure regions for billing purposes. The bandwidth pricing page has additional information on pricing for data ingress, egress, and transfer.

Subscription type

Some Azure subscription types also include usage allowances, which affect costs.

For example, an Azure free trial subscription provides access to a number of Azure products that are free for 12 months. It also includes credit to spend within your first 30 days of sign-up. You'll get access to more than 25 products that are always free (based on resource and region availability).

Azure Marketplace

Azure Marketplace lets you purchase Azure-based solutions and services from third-party vendors. This could be a server with software preinstalled and configured, or managed network firewall appliances, or connectors to third-party backup services. When you purchase products through Azure Marketplace, you may pay for not only the Azure services that you're using, but also the services or expertise of the third-party vendor. Billing structures are set by the vendor.

All solutions available in Azure Marketplace are certified and compliant with Azure policies and standards. The certification policies may vary based on the service or solution type and Azure service involved. Commercial marketplace certification policies has additional information on Azure Marketplace certifications.

Next unit: Compare the Pricing and Total Cost of Ownership calculators

Compare the Pricing and Total Cost of Ownership calculators

- 2 minutes

The pricing calculator and the total cost of ownership (TCO) calculator are two calculators that help you understand potential Azure expenses. Both calculators are accessible from the internet, and both calculators allow you to build out a configuration. However, the two calculators have very different purposes.

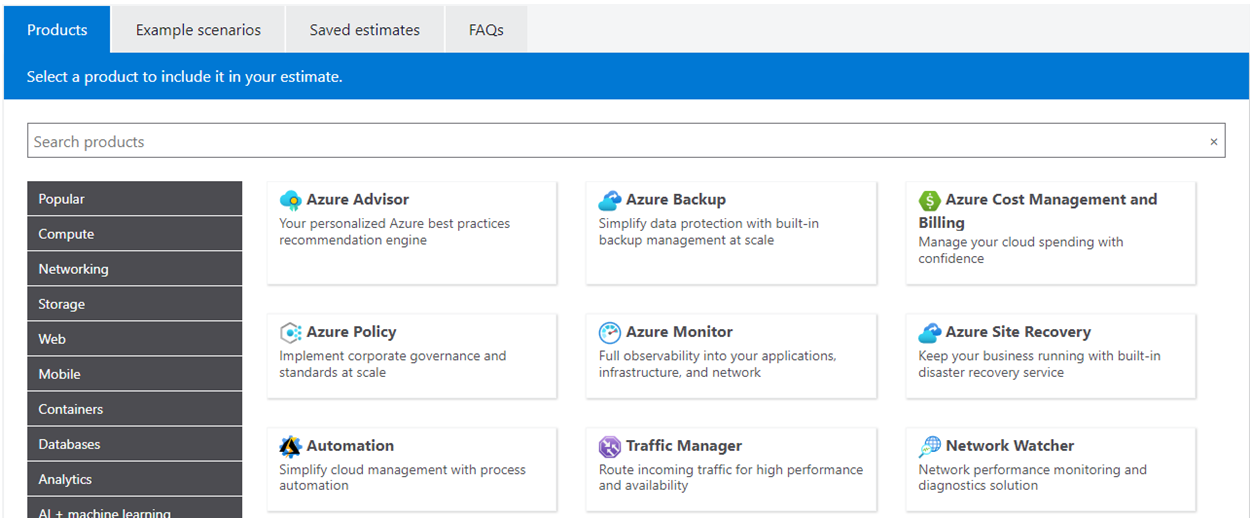
Pricing calculator

The pricing calculator is designed to give you an estimated cost for provisioning resources in Azure. You can get an estimate for individual resources, build out a solution, or use an example scenario to see an estimate of the Azure spend. The pricing calculator's focus is on the cost of provisioned resources in Azure.

Note

The Pricing calculator is for information purposes only. The prices are only an estimate. Nothing is provisioned when you add resources to the pricing calculator, and you won't be charged for any services you select.

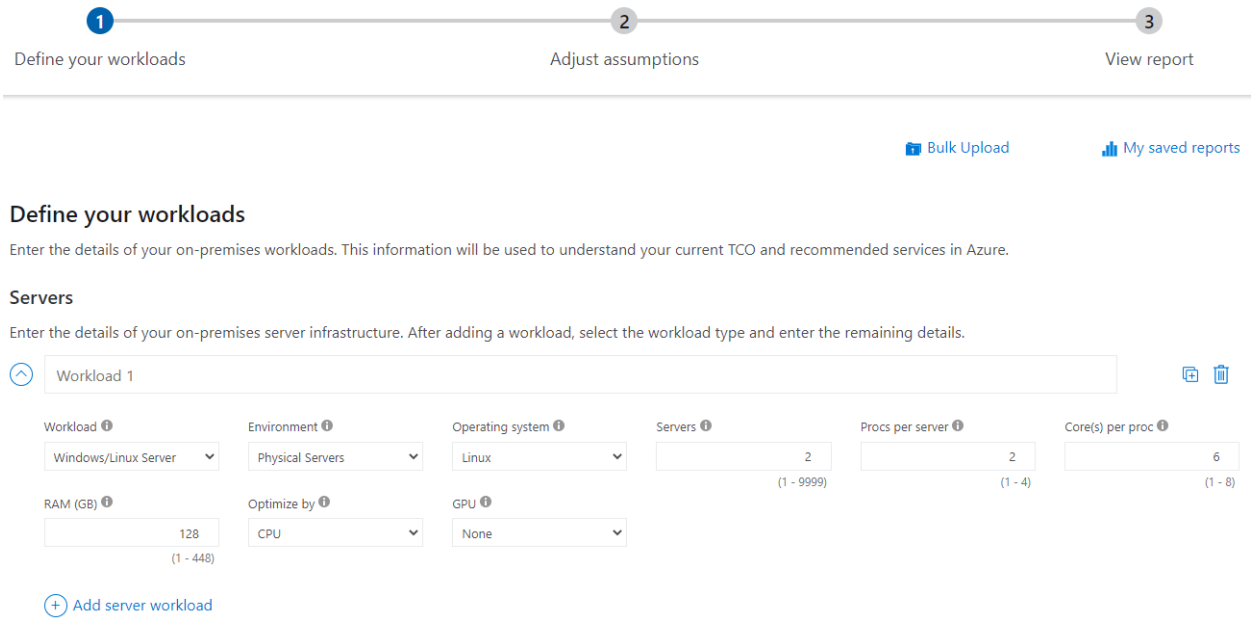
With the pricing calculator, you can estimate the cost of any provisioned resources, including compute, storage, and associated network costs. You can even account for different storage options like storage type, access tier, and redundancy.



TCO calculator

The TCO calculator is designed to help you compare the costs for running an on-premises infrastructure compared to an Azure Cloud infrastructure. With the TCO calculator, you enter your current infrastructure configuration, including servers, databases, storage, and outbound network traffic. The TCO calculator then compares the anticipated costs for your current environment with an Azure environment supporting the same infrastructure requirements.

With the TCO calculator, you enter your configuration, add in assumptions like power and IT labor costs, and are presented with an estimation of the cost difference to run the same environment in your current datacenter or in Azure.



Next unit: Exercise - Estimate workload costs by using the Pricing calculator

Exercise - Estimate workload costs by using the Pricing calculator

- 10 minutes

In this exercise, you use the Pricing calculator to estimate the cost of running a basic web application on Azure.

Start by defining which Azure services you need.

Note

The Pricing calculator is for information purposes only. The prices are only an estimate, and you won't be charged for any services you select.

Define your requirements

Before you run the Pricing calculator, you need a sense of what Azure services you need.

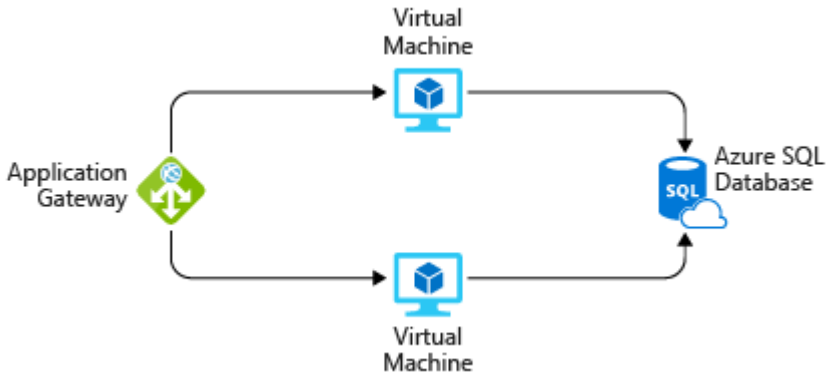
For a basic web application hosted in your datacenter, you might run a configuration similar to the following.

An ASP.NET web application that runs on Windows. The web application provides information about product inventory and pricing. There are two virtual machines that are connected through a central load balancer. The web application connects to a SQL Server database that holds inventory and pricing information.

To migrate to Azure, you might:

- Use Azure Virtual Machines instances, similar to the virtual machines used in your datacenter.
- Use Azure Application Gateway for load balancing.
- Use Azure SQL Database to hold inventory and pricing information.

Here's a diagram that shows the basic configuration:



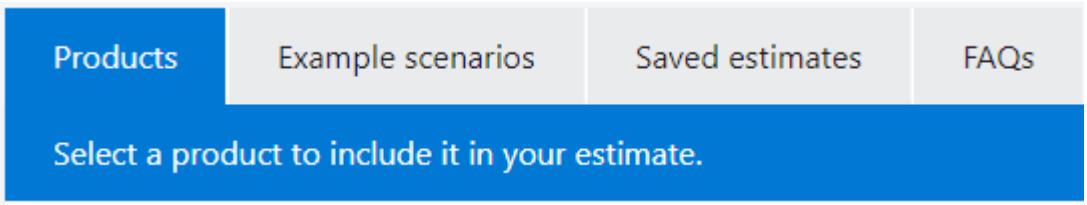
In practice, you would define your requirements in greater detail. But here are some basic facts and requirements to get you started:

- The application is used internally. It's not accessible to customers.
- This application doesn't require a massive amount of computing power.
- The virtual machines and the database run all the time (730 hours per month).
- The network processes about 1 TB of data per month.
- The database doesn't need to be configured for high-performance workloads and requires no more than 32 GB of storage.

Explore the Pricing calculator

Let's start with a quick tour of the Pricing calculator.

1. Go to the Pricing calculator.
2. Notice the following tabs:



   - **Products** This is where you choose the Azure services that you want to include in your estimate. You'll likely spend most of your time here.
   - **Example scenarios** Here you'll find several *reference architectures*, or common cloud-based solutions that you can use as a starting point.
   - **Saved estimates** Here you'll find your previously saved estimates.
   - **FAQs** Here you'll discover answers to frequently asked questions about the Pricing calculator.

Estimate your solution

Here you add each Azure service that you need to the calculator. Then you configure each service to fit your needs.

Tip

Make sure you have a clean calculator with nothing listed in the estimate. You can reset the estimate by selecting the trash can icon next to each item.

Add services to the estimate

1. On the **Products** tab, select the service from each of these categories:

   Category

   Service

   Compute

   Virtual Machines

   Databases

   Azure SQL Database

   Networking

   Application Gateway

2. Scroll to the bottom of the page. Each service is listed with its default configuration.

Configure services to match your requirements

1. Under **Virtual Machines**, set these values:

   Setting

   Value

   Region

   West US

   Operating system

   Windows

   Type

   (OS Only)

Tier

Standard

Instance

D2 v3

Virtual machines

2 x **730 Hours**

Leave the remaining settings at their current values.

2. Under **Azure SQL Database**, set these values:

   Setting

   Value

   Region

   West US

   Type

   Single Database

   Backup storage tier

   RA-GRS

   Purchase model

   vCore

   Service tier

   General Purpose

   Compute tier

   Provisioned

Generation

Gen 5

Instance

8 vCore

Leave the remaining settings at their current values.

3. Under **Application Gateway**, set these values:

   Setting

   Value

   Region

   West US

   Tier

   Web Application Firewall

   Size

   Medium

   Gateway hours

   2 x **730 Hours**

   Data processed

   1 TB

   Outbound data transfer

   5 GB

   Leave the remaining settings at their current values.

Review, share, and save your estimate

At the bottom of the page, you see the total estimated cost of running the solution. You can change the currency type if you want.

At this point, you have a few options:

- Select **Export** to save your estimate as an Excel document.
- Select **Save** or **Save as** to save your estimate to the **Saved Estimates** tab for later.
- Select **Share** to generate a URL so you can share the estimate with your team.

You now have a cost estimate that you can share with your team. You can make adjustments as you discover any changes to your requirements.

Experiment with some of the options you worked with here, or create a purchase plan for a workload you want to run on Azure.

Next unit: Exercise - Compare workload costs using the TCO calculator