
AWS Pricing Calculator

User Guide



AWS Pricing Calculator: User Guide

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What is AWS Pricing Calculator?

AWS Pricing Calculator lets you explore AWS services and create an estimate for the cost of your use cases on AWS. You can model your solutions before building them, explore the price points and calculations behind your estimate, and find the available instance types and contract terms that meet your needs. This enables you to make informed decisions about using AWS. You can plan your AWS costs and usage or price out setting up a new set of instances and services.

AWS Pricing Calculator is useful both for people who have never used AWS and for users who want to reorganize or expand their AWS usage. You don't need any experience with the cloud or AWS to use AWS Pricing Calculator.

Accessing AWS Pricing Calculator

AWS Pricing Calculator provides only a console interface at <https://calculator.aws/#/>. It doesn't provide an API.

Prerequisites for using AWS Pricing Calculator

You don't need an AWS account or in-depth knowledge of AWS to use AWS Pricing Calculator.

For best results, we suggest that you have a plan for how you want to use AWS before starting your estimate. For example, decide whether you want to break out your estimate by cost center, by product that you run on AWS, or by regional stacks.

AWS Pricing Calculator Regions

You can use AWS Pricing Calculator to generate monthly cost estimates for all Regions supported by your preferred service. For information about each service's available Regions, see the corresponding service user guide documentation.

Pricing for AWS Pricing Calculator

AWS Pricing Calculator is free for use. It provides an estimate of your AWS fees and charges, but the estimate doesn't include any taxes that might apply to the fees and charges. AWS Pricing Calculator provides pricing details for your information only. If the prices on the marketing page are different from the prices that AWS Pricing Calculator uses, AWS honors the prices from the marketing pages. For more information about AWS service pricing, see [Cloud Services Pricing](#).

The prices that AWS Pricing Calculator uses for the estimates come from the AWS Price List API. For more information about the AWS Price List API, see [Using the AWS Price List API](#) in the [AWS Billing and Cost Management User Guide](#).

Getting started

The Getting Started chapter walks you through a task using AWS Pricing Calculator so that you can get an idea of how to use AWS Pricing Calculator. In this case, we walk you through getting an estimate for an Amazon EC2 instance using the Amazon EC2 **Quick estimate** option. The Amazon EC2 quick estimate enables you to add an Amazon EC2 instance to your estimate without delving deeply into the different Amazon EC2 options. This enables you to get an estimate without knowing the technical details of all of the Amazon EC2 instance types.

Topics

- [Understanding your estimates \(p. 2\)](#)
- [Prerequisites \(p. 2\)](#)
- [Step 1: Create an estimate \(p. 2\)](#)
- [Step 2: \(Optional\) Add a group \(p. 3\)](#)
- [Step 3: Add and configure a service \(p. 3\)](#)

Understanding your estimates

When you generate an estimate, you can either add services directly to your estimate or create a group and add the services to your group.

This guide shows you how to set up a group with an Amazon EC2 instance that you can use to perform tasks such as run a small program or host a website.

Tasks

To complete this tutorial, perform the following tasks:

1. [Step 1: Create an estimate \(p. 2\)](#)
2. [Step 2: \(Optional\) Add a group \(p. 3\)](#)
3. [Step 3: Add and configure a service \(p. 3\)](#)

Prerequisites

This tutorial doesn't require any initial setup. You can use it without an AWS account and without committing to anything.

Step 1: Create an estimate

To get started generating an estimate, create your estimate and assign your estimate a Region.

To create your estimate

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.
2. Choose **Create estimate**.

3. On the **Select service** page, find the service of your choice and choose **Configure**.
4. Add a **Description** for the estimated service.
5. Select a **Region**.
6. Enter your settings in the **Service settings** section.
7. Choose **Add to my estimate**.

Step 2: (Optional) Add a group

A group enables you to organize services together. You can add one or more services to each group. You can use groups to organize your estimate in different ways, such as by cost center, service stack, product architecture, or client.

Note

You can customize Regions for each service at a service level, by using the Region dropdown menu. You can't change Regions at a group level. For more information about customizing Regions for services, see [Step 3: Add and configure a service \(p. 3\)](#).

To add a group to your estimate

1. To create a group, in the upper-right header, choose **Add group**.
2. For **Group name**, enter *My service group*.
3. Choose **Add group**.

Step 3: Add and configure a service

After you have an estimate and (optionally) a group, add and configure services to your estimate to generate estimated costs. If you didn't create a group, use the **My estimate** view instead of the **My service group** view. Everything else in the following procedure remains the same.

In this case, we're adding Amazon EC2 using the Amazon EC2 **Quick estimate** option.

To add and configure a service for your estimate

1. On the **My service group** page choose **Add service**, which brings you to a page of services that you can add to your estimate.
2. On the **Add service** page, select **Amazon EC2** and choose **Configure** in the upper-right header. This adds Amazon EC2 to your group and takes you to the **Quick estimate** view, where you can configure what you want in an Amazon EC2 instance.

The **Quick estimate** view is preloaded with default values, enabling you to see a starting estimate without adding or changing any information. You can change any of the values for the following parameters or keep the defaults when applicable:

- Description
- Region
- The operating system
- The number of Amazon EC2 instances
- The Amazon EC2 instance search options
- The pricing model
- The reservation term
- The payment options

- The storage volume
 - The storage amount
3. Choose **Add to my estimate**.

This adds an Amazon EC2 instance with the selected parameters to the group that you created in step 1 and returns you to the **My estimate** page. The **Services** section lists the service estimates that you added.

The **My service group** page shows you how much the selected default instance would likely cost you. The **Service** section lists your service names with the Region that you specified for each service. You can create multiple estimates for the same service with different Regions to compare price differences. Note that estimates are just that: estimates. AWS charges are calculated using the actual AWS usage for an account.

Generating your estimate

You can add a service directly to your estimate or to one or more groups to get an estimate for that service.

To generate an estimate, create an estimate and add services or groups and services to your estimate. AWS Pricing Calculator provides you with multiple estimates, including the cost estimate for your entire estimate or the cost estimates any of the individual groups in your estimate.

Groups are optional but useful. They enable you to add multiple Regions to your estimate or organize your estimate in many ways such as by cost center, team, or product.

Note

AWS provides a free tier that enables you to try some AWS services for free. The free tier covers only certain instances or usage and for only a limited amount of time. AWS Pricing Calculator includes non-expiring free tiers by default, but assumes that you aren't using the free tier and doesn't include any expiring free tiers in your estimate.

Topics

- [Reading an estimate \(p. 5\)](#)
- [Best practices for generating estimates \(p. 6\)](#)
- [Using groups \(p. 6\)](#)
- [Generating Amazon EC2 estimates \(p. 7\)](#)
- [Generating Windows Server and SQL Server on Amazon EC2 estimates \(p. 15\)](#)
- [Generating AWS Support estimates \(p. 26\)](#)

Reading an estimate

Estimates are broken into multiple sections. At the top of the page is your estimate, which is broken into your **First 12 months total**, your total upfront, and your total monthly. The total for your first 12 months is the total estimate for your current group and all of the services and groups in your current group, and it combines the upfront and monthly estimates. The upfront and monthly estimates are how much you are estimated to pay upfront as you set up your AWS stack and how much you're estimated to spend every month while you run your AWS stack.

Within a group, you can see how much each service is estimated to cost. If you want to price out different ways to build your AWS setup, you can use different groups for each variation of your setup and compare the estimates for the different setups.

To see the full estimate for all of your groups, navigate to your estimate. For more information, see [Navigating your estimate \(p. 5\)](#).

Navigating your estimate

If you create groups within groups, the **Organization** section appears on the left side of the page. The **Organization** section enables you to see where you are in a multi-level estimate. It always shows your estimate at the top, the parent of your current group (which might be your estimate), your current

group, and any children groups that are in your current group. You can navigate to any visible groups by choosing them. If your current group is more than three levels deep, a ... replaces the groups between your estimate and the parent group of your current group.

Showing calculations

When you add a service to your estimate and choose your parameters, you can see the calculations that AWS Pricing Calculator uses to generate your estimate. Choose **Show calculation** to see the exact math.

Best practices for generating estimates

To get the most out of your estimates, you should have a good idea of your basic requirements. For example, if you're going to try Amazon Elastic Compute Cloud (Amazon EC2), it might help if you know what kind of operating system you need, what your memory requirements are, and how much I/O you need. You should also decide whether you need storage, such as if you're going to run a database and how long you intend to use the servers. You don't need to make these decisions before generating an estimate, though. You can play around with the service configuration and parameters to see which options fit your use case and budget best.

It's also a good idea to consider how you want to organize your estimate. For more information, see [Using groups \(p. 6\)](#).

Using groups

You can organize your AWS estimates by groups that you define. A group can reflect how your company is organized, such as providing estimates by cost center, or it can reflect other organization methods, such as by product stack or product architecture. For example, if you want to price out different ways to build your AWS setup, you can use different groups for each variation of your setup and compare the estimates for the different setups. You can also generate one estimate for how much running a website might cost you and another estimate for how much running a machine learning process might cost you, enabling you to see the combined estimate for your AWS usage.

AWS Pricing Calculator provides estimates for AWS Regions individually. To generate an estimate for multiple Regions, you must create a group for each Region. For example, say that you want to compare the cost of running servers in two different locations, such as US East (N. Virginia) (us-east-1) and Asia Pacific (Seoul) (ap-northeast-2). You can generate an estimate for US East (N. Virginia) (us-east-1) with one group and an estimate for Asia Pacific (Seoul) (ap-northeast-2) with a second group and then compare the two estimates.

Note

You can't change the Region of a group after you have added a service to it. To change the Region, create a group and then edit it. After you edit the group, you can add services for that Region.

To assign a group to a Region

You can use the following procedure to assign a group to a Region.

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.
2. In the group that you want to assign to a Region, for **Action**, choose **Edit**.
3. Choose the Region that you want to assign this group to.
4. Choose **Save**.

Generating Amazon EC2 estimates

There are two ways to generate an Amazon EC2 estimate: the quick estimate path and the advanced estimate path. Use the quick estimate path for a fast route to a rough estimate. Use the advanced estimate path for a more detailed estimate that accounts for workload, data transfer costs, additional storage options, and other, less common instance requirements.

The quick and advanced paths require different information, but the results are identical on the group level. That means that you can use both paths to configure Amazon EC2 in the same group. You can also toggle between quick and advanced. If you have a good idea of which Amazon EC2 instance you need for some parts of your planned AWS usage, but don't know many details about that usage, you can still get an estimate that covers both cases.

Note

If you toggle between the quick and advanced paths, your estimate might be higher than if you only used the quick path. The advanced path sets defaults that can carry over to the quick path and raise your estimate.

For example, Márcia knows that she needs an Amazon EC2 instance with Amazon EBS snapshots taken every hour. She also knows that she needs some Amazon EC2 instances with more flexible snapshot requirements, but she doesn't know how many hours she needs for the more flexible instances. The quick estimate path enables her to generate an estimate for the Amazon EC2 instances that don't have the hourly snapshot requirement and for which she doesn't know how many hours she needs. The advanced estimate path enables her to generate an estimate for the Amazon EC2 instances with an hourly snapshot requirement.

Topics

- [Quick estimates \(p. 7\)](#)
- [Advanced estimates \(p. 9\)](#)

Quick estimates

The quick estimate path is designed to give you a ballpark estimate while requiring minimal information and parameters. This way you can get a rough idea of how much AWS might cost you even when you don't have all, or even many, of the details of how you plan to use AWS.

Each parameter has a default setting, so if you don't know what you want for that particular parameter, you can still generate an estimate.

The quick estimate path has the following sections and parameters:

- [Amazon EC2 specifications \(p. 7\)](#)
- [Pricing strategy \(p. 8\)](#)
- [Amazon EBS \(p. 9\)](#)

Note

For a step-by-step tutorial on how to generate an Amazon EC2 estimate using the **Quick estimate** option, see [Getting started \(p. 2\)](#).

Amazon EC2 specifications

These settings determine the Amazon EC2 instance that AWS Pricing Calculator uses to generate an estimate for you.

Select your operating system

The default value for the operating system (OS) is Linux.

Number of EC2 instances

The default value is one. AWS Pricing Calculator uses this default because it's the minimum number that you might need.

Enter requirements per instance

To find an instance, search either by minimum requirements or by name. Minimum requirements are most useful when you know the specifications of the instances that you want, and instance name is more useful if you already know the instance family or size of the instance that you want. For example, you can search either for an instance with a minimum of four vCPUs and 16 GB of memory or for a t2 or medium instance.

There are multiple defaults when you search for an instance by instance requirements. The default value for **vCPUs** is four, and the default for **Memory** is 16 (GB). AWS Pricing Calculator uses these defaults because they're the minimum required to do general-purpose processing.

Instance name

To find an instance, search either by minimum requirements or by name. Minimum requirements are most useful when you know the specifications of the instances that you want, and instance name is more useful if you already know the instance family or size of the instance that you want. For example, you can search either for an instance with a minimum of 4 vCPUs and 16 GB of memory or for a t2 or medium instance.

There is no default value for the instance name because AWS Pricing Calculator searches the available instances for the least expensive option, which can change over time.

For information about the available Amazon EC2 instance families, see [Instance type \(p. 10\)](#).

Pricing strategy

These settings determine the pricing strategy that AWS Pricing Calculator uses to generate an estimate for you.

Pricing model

The pricing model determines whether you are searching for a pay-as-you-use instance or an instance that you can reserve in advance. Reserving an instance is not the same as paying for the use of an instance. For Reserved Instance (RI) payment options, see [Payment options \(p. 8\)](#).

The default value is Standard Reserved Instances. AWS Pricing Calculator uses this default because they are the most common Amazon EC2 purchase and offer the most flexibility and the highest discount for most use cases.

Contract terms

When you reserve an RI, you purchase a reservation for the period of your contract. Contracts can be for either one or three years.

The default value is one year. AWS Pricing Calculator uses this default because it's the least expensive option for trying out AWS.

Payment options

For RIs, payment options determine when you pay for your reservation. You can pay for the entire reservation upfront, which is a hefty single-time payment but you have no monthly payments. You can pay for the RI with a partial upfront payment and a monthly payment, which gives you a smaller upfront cost but accrues monthly costs. You can also pay with no upfront payment, which means

you pay only on a monthly basis. All upfront gives you the best discount, but no upfront and partial upfront spread your costs out over a greater period of time.

The default value for the payment options is No Upfront. AWS Pricing Calculator uses this default because it gives you the least expensive start-up price.

Amazon EBS

These settings determine the Amazon EBS settings that AWS Pricing Calculator uses to generate an estimate for you. Amazon Elastic Block Store (Amazon EBS) is a type of storage that you can connect to your Amazon EC2 instance. It enables you to do things such as back up your instance, create a boot volume, or run a database on your instance. For more information on how you can use Amazon EBS, see the [Amazon Elastic Block Store documentation](#).

Storage volume

The storage volume determines what kind of storage that Amazon EBS assigns to your instance. Different types have different capabilities, such as better I/O, faster calculations, or slower, less expensive options for use cases such as boot volumes and backups.

The default value is the General Purpose SSD. AWS Pricing Calculator uses this default because it's good at both I/O and storage while not being expensive.

Storage amount

The storage amount determines how much storage your Amazon EBS volume has.

The default value is 30 GB. AWS Pricing Calculator uses this default because it's a decent amount of storage for a decent price.

Advanced estimates

The advanced estimate path is designed to give you a more accurate estimate, more parameter flexibility when generating an estimate, and the ability to fine-tune your estimate. It requires more in-depth knowledge of your Amazon EC2 needs and requirements than an estimate that you generate using the quick estimate path.

Use the advanced estimate path for estimates that need to account for workload, data transfer costs, additional storage options, and other, less common instance requirements. For example, you know that you get a lot of traffic on Mondays but not much traffic throughout the rest of the week, and you want an estimate that accounts for this workload.

The advanced estimate path has the following sections and parameters:

- [Operating system \(p. 9\)](#)
- [Instance type \(p. 10\)](#)
- [Workload \(p. 10\)](#)
- [Pricing \(p. 11\)](#)
- [Data transfer \(p. 13\)](#)
- [Memory \(block storage\) \(p. 13\)](#)

Operating system

This setting is the OS on an Amazon EC2 instance. AWS Pricing Calculator generates your estimate using Amazon Machine Images (AMIs) that match your chosen OS. Choose the OS that best matches your needs.

Linux

AWS Pricing Calculator generates your estimate using a standard Linux AMI.

Linux SQL

AWS Pricing Calculator generates your estimate using a Linux SQL AMI.

Red Hat Enterprise Linux

AWS Pricing Calculator generates your estimate using a Red Hat Enterprise Linux AMI.

SUSE Linux Enterprise Server

AWS Pricing Calculator generates your estimate using a SUSE Linux Enterprise AMI.

Windows Server

AWS Pricing Calculator generates your estimate using a standard Windows Server AMI.

Windows Server Bring Your Own License

AWS Pricing Calculator generates your estimate without including your license costs.

Windows Server with SQL Server Enterprise

AWS Pricing Calculator generates your estimate using a Windows Server with SQL server Enterprise AMI.

Windows Server with SQL Server Standard

AWS Pricing Calculator generates your estimate using a Windows Server with SQL Server Standard AMI.

Windows Server with SQL Server Web

AWS Pricing Calculator generates your estimate using a Windows Server with SQL Server Web AMI.

Instance type

AWS Pricing Calculator lists all available instance types. AWS Pricing Calculator starts with the default instance type **t2.xlarge** selected. You can use the search bar to filter the instance list by column names. If you don't select a column to filter by, AWS Pricing Calculator uses the **API name** column as the default.

For more information about the prices of available instance types, see the [Amazon EC2 Pricing](#) page.

Workload

Workloads are the usage patterns that match your Amazon EC2 usage. Choosing the workload that most closely matches what you use reduces the number of On-Demand and unused RI hours that you might purchase by covering your usage with the best combination of RIs and On-Demand Instances. You can define more than one workload for your estimate.

Constant usage

This workload is best for a use case that has a constant, predictable load, such as logging traffic to a website or running a process in the background.

Daily spike

This workload is best for usage patterns that peak once a day, such as running several jobs at midnight or a morning news spike.

Weekly spike

This workload is best for patterns that peak once a week, such as blogs that post once a week or when you air a weekly television show.

Monthly spike

This workload is best for traffic that spikes once a month, such as monthly invoices, payroll, or other monthly reports.

Pricing

The AWS Pricing Calculator advanced estimate path offers three pricing models for Amazon EC2 instances: Cost optimized, On-Demand, or Reserved. Cost optimized combines On-Demand Instances and RIs for the least expensive option.

Pricing model

The pricing model determines whether you are looking for a pay-as-you-use instance, or an instance that you can reserve in advance. Reserving an instance is not the same as using an instance.

Cost optimized

The default value for the pricing model is **Cost optimized**. AWS Pricing Calculator uses **Cost optimized** as the default because it provides a balance between On-Demand Instances and RIs. This means that AWS Pricing Calculator tries to generate an estimate where you aren't buying more RI hours than you need, but you still have the coverage that you need for your peak traffic periods, which your RIs might not cover. AWS Pricing Calculator does this by determining the break-even point between the utilization and prices of On-Demand and Reserved Instances. For example, if RIs provide a 33% discount then any RIs that are utilized less than 67% would be underutilized, and an On-Demand Instance would be more cost-effective.

For example, you might need only two RIs to cover your day-to-day traffic, but every week you expect a period of traffic where you need four instances. AWS Pricing Calculator generates an estimate that assumes that you purchase two instances for use during the entire week and that you use On-Demand Instances to cover your peak traffic. This enables you to take advantage of the RI discount for your normal traffic, but you avoid paying for two instance reservations that go largely unused.

On-Demand

On-Demand Instances let you pay for an instance's compute capacity by the hour or second (for a minimum of 60 seconds) with no long-term commitments. This means that you don't need to plan, purchase, or maintain instances that you don't use often.

For example, you're demoing a program to a friend. You don't need the program to run for long, but your local computer can't handle the load. You can use an On-Demand Instance to run the program and show it off, but you don't need to worry about paying for the server once you're done with it.

Reserved

RIs provide a discount compared to On-Demand Instance pricing and can be purchased for a one-year or three-year term. Depending on the type of RI, you can change your Availability Zone, instance size, and networking type or your instance family, operating system, and tenancy. This enables you to pay less for instances that you use for long periods of time.

For example, you run a website. You're not going to take down your website often, so you want to leave the server running all of the time. You can purchase a reservation and run your website on the RI.

Dedicated

Dedicated Instances are available for On-Demand and Reserved Instances. You pay the normal hourly usage fee as well as an hourly region fee. Dedicated Instances run in a VPC on hardware that is dedicated to a single customer. They're physically isolated at the host hardware level from instances that belong to other AWS accounts.

For example, you run a server with a server-bound software license. A Dedicated Instance enables you to bind your license to a specific instance and meet corporate compliance and regulatory requirements.

Contract terms

When you purchase an RI, you agree to pay for the entire term of the RI, upfront, monthly, or with a combination of the two options. The terms can last for one or three years. Paying upfront is a bigger one-time cost, but less expensive overall. Paying monthly enables you to spread out your costs over multiple billing periods.

No contract

No contract means that you're using On-Demand Instances instead of an RI. There are no upfront or monthly costs, and you pay only for what you use. However, you pay full price instead of the discounted rate provided by purchasing an RI.

1 YR No Upfront

For a one-year no-upfront term, you agree to purchase an RI for a one-year period. There is no upfront fee, but you pay a monthly fee.

1 YR Partial Upfront

For a one-year partial-upfront term, you agree to purchase an RI for a one-year period. There is an upfront fee, but you also pay a monthly fee. This means that the upfront cost is higher than if you had a no-upfront term, but the monthly cost is lower, and you pay an overall lower price than for a no-upfront RI.

1 YR No Upfront - Convertible Reserved Instances

For a one-year no-upfront term, you agree to purchase an RI for a one-year period. There is no upfront fee, but you pay a monthly fee. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

1 YR Partial Upfront - Convertible Reserved Instances

For a one-year partial-upfront term, you agree to purchase an RI for a one-year period. There is an upfront fee, but you also pay a monthly fee. This means that the upfront cost is higher than if you had a no-upfront term, but the monthly cost is lower, and you pay an overall lower price than for a no-upfront RI. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

1 YR Full Upfront - Convertible Reserved Instances

For a one-year full-upfront term, you agree to purchase an RI for a one-year period. There is no monthly fee—you pay the entire cost when you purchase the RI. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

3 YR No Upfront

For a three-year no-upfront term, you agree to purchase an RI for a three-year period. There is no upfront fee, but you pay a monthly fee.

3 YR Partial Upfront

For a three-year partial-upfront term, you agree to purchase an RI for a three-year period. There is an upfront fee, but you also pay a monthly fee. This means that the upfront cost is higher than if you had a no-upfront term, but the monthly cost is lower, and you pay an overall lower price than for a no-upfront RI.

3 YR Full Upfront

For a three-year full-upfront term, you agree to purchase an RI for a three-year period. There is no monthly fee—you pay the entire cost when you purchase the RI.

3 YR No Upfront - Convertible Reserved Instances

For a three-year no-upfront term, you agree to purchase an RI for a three-year period. There is no upfront fee, but you pay a monthly fee. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

3 YR Partial Upfront - Convertible Reserved Instances

For a three-year partial-upfront term, you agree to purchase an RI for a three-year period. There is an upfront fee, but you also pay a monthly fee. This means that the upfront cost is higher than if you had a no-upfront term, but the monthly cost is lower, and you pay an overall lower price than for a no-upfront RI. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

3 YR Full Upfront - Convertible Reserved Instances

For a three-year full-upfront term, you agree to purchase an RI for a three-year period. There is no monthly fee—you pay the entire cost when you purchase the RI. For a Convertible RI, you can change the instance families, operating systems, or tenancies of your Convertible RIs over the course of your RI term.

Data transfer

You can accrue additional costs by transferring data into and out of Amazon EC2. If you know how much data you can expect to upload or download in a month, you can add these costs to your estimate. For more information, see the **Data Transfer** section of the [On-Demand Pricing](#) page.

Memory (block storage)

You can add estimates for storage attached to your instance or for snapshots taken of your instance. Attaching storage to your instance enables you to run databases, store logs, or create boot volumes for your instance. Snapshots create backups of the data on your instance, and you can add estimates for regular snapshots to your main estimate.

Generating Amazon EBS estimates

You can back up the data on your Amazon EBS volumes to Amazon Simple Storage Service (Amazon S3) by taking point-in-time snapshots. Snapshots are incremental backups, which means that only the blocks on the device that have changed since your most recent snapshot are saved. This minimizes the time required to create the snapshot and saves on storage costs by not duplicating data. When you delete a snapshot, only the data unique to that snapshot is removed. Each snapshot contains all of the information that you need to restore your data (from the moment when the snapshot was taken) to a new Amazon EBS volume.

The total cost for a snapshot is the cost of the initial snapshot plus the incremental snapshots. AWS Pricing Calculator calculates prices with the assumption that you use AWS Step Functions and Amazon

CloudWatch to create an automated monthly retention period for your snapshots, meaning that your snapshots are replaced every month.

Calculating Amazon EBS prices

Snapshots are saved at a specific frequency (monthly, weekly, daily, or hourly), so the retention period of each incremental snapshot for a month decreases as the month progresses. AWS Pricing Calculator tries to estimate the cost of the services that you selected on a monthly basis.

The prices for snapshots reflect the initial snapshot and the incremental snapshots.

Calculating weekly incremental Amazon EBS prices

AWS Pricing Calculator uses 7 to 30 different data points to calculate the estimate for any specific incremental snapshot. We can express the monthly calculation using the following mathematical formula for a snapshot that is scheduled to be taken weekly and has a monthly retention rate.

$$\sum_{i=1}^3 (\text{Cost of each snapshot} * (i / 4)) * \text{storage amount changed}$$

Let's use this formula in an example. For snapshot storage, you specify the frequency as weekly and the storage amount changed as 30 GB. Each snapshot storage costs \$0.05/GB.

Week	Snapshot size	Retention length	Cost formula	Snapshot cost
Snapshot for Week 1	30 GB	Three weeks	30 x \$0.0375 [\$0.05 x ¾]	\$1.125
Snapshot for Week 2	30 GB	Two weeks	30 x \$0.025 [\$0.05 x ½]	\$0.75
Snapshot for Week 3	30 GB	One week	30 x \$0.0125 [\$0.05 x ¼]	\$0.375

The total monthly cost of these three incremental snapshots, taking the retention period into consideration, is \$2.25.

By comparison, if we don't take the retention period into consideration, the calculation for the snapshot behaves as though each snapshot is stored for the entire duration. We can express this using the following mathematical formula.

$$\sum_{i=1}^3 \text{Cost of each snapshot} * \text{storage amount changed}$$

Let's use the same example as before but without taking the retention period into consideration. For snapshot storage, you specify the frequency as weekly and the storage amount changed as 30 GB. Each snapshot storage costs \$0.05/GB.

Week	Snapshot size	Retention length	Cost formula	Snapshot cost
Snapshot for Week 1	30 GB	Not considered	30 x \$0.05	\$1.50

Week	Snapshot size	Retention length	Cost formula	Snapshot cost
Snapshot for Week 2	30 GB	Not considered	30 x \$0.05	\$1.50
Snapshot for Week 3	30 GB	Not considered	30 x \$0.05	\$1.50

In this case, the total monthly cost of these three incremental snapshots, without taking the retention period into consideration, is \$4.50.

In other words, the cost of a snapshot calculated with retention is 50% lower than the cost of a snapshot calculated without retention.

Generating Windows Server and SQL Server on Amazon EC2 estimates

You can use the workload calculator in AWS Pricing Calculator to guide you on AWS tenancy qualifications for Microsoft Windows Server and SQL Server on Amazon Elastic Compute Cloud (Amazon EC2). You can use this feature to estimate AWS cost using minimal information and parameters. You can generate an estimate even if you don't know the details for each parameter, because each parameter includes a default setting.

For options for using Microsoft software licenses on the AWS Cloud, see [Microsoft Licensing on AWS](#).

To generate an estimate for Windows Server and SQL Server on Amazon EC2

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.
2. Choose **Create estimate**.
3. Under **Windows Server and SQL Server on Amazon EC2**, choose **Configure**.
4. On the **Configure Windows Server and SQL Server on Amazon EC2** page, choose your customized settings.
 - For information about your tenancy choices, see [Licensing and tenancy recommendations \(p. 24\)](#).
 - For information about how to choose your machine specifications, see [Configuring machine specifications \(p. 24\)](#).
 - For information about how to choose your pricing strategy, see [Pricing strategy \(p. 26\)](#).
 - For information about how to choose your cost details, see [Cost details \(p. 26\)](#).
5. Choose **Add to my estimate**.

For a step-by-step example showing how to generate an estimate for Windows Server and SQL Server on Amazon EC2, see [Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator \(p. 16\)](#).

Topics

- [Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator \(p. 16\)](#)
- [Licensing and tenancy recommendations \(p. 24\)](#)
- [Configuring machine specifications \(p. 24\)](#)
- [Pricing strategy \(p. 26\)](#)

- [Cost details \(p. 26\)](#)

Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator

This tutorial shows you how to use the Microsoft Windows Server and Microsoft SQL Server on the Amazon EC2 calculator to generate a pricing estimate.

To start pricing your workload, open the [AWS Pricing Calculator console](#), and navigate to **Configure Windows Server and SQL Server on Amazon EC2**.

What are your license options?

AWS offers flexible cost optimizations so you have options that best fits your needs. The following three types of licenses are offered:

- Flexible pay-as-you-go with License Included (LI)
- Bring your Microsoft License Mobility benefits to AWS (BYOL)
- Dedicated options for products without Microsoft License Mobility

Example scenario table

Example

This example uses the following workload scenario to show several capabilities in the AWS Pricing Calculator.

Host description	vCPUs	Ram	Storage (GB)	IOPS	Software	Optimize vCPUs	Quantity	Passive node count
Server 1	16	800	5000	60000	SQL Enterprise Edition	16	10	5
Server 2	16	64	3000	15000	SQL Standard Edition	16	8	4
Server 3	8	16	1000		SQL Web Edition	8	10	0
Server 4	4	32	500		Windows	N/A	8	N/A

Begin your estimate by naming your estimate and selecting your Region.

- Description: `Workload_SQL_BYOL`
- Region: `US East (Ohio)`

This is your AWS Region choice. All AWS resources are priced based on your Region choice.

Topics

- [Step 1: Choose your licensing and tenancy recommendation \(p. 17\)](#)
- [Step 2: Configure your machine specifications \(p. 18\)](#)
- [Step 3: Choose a pricing strategy \(p. 20\)](#)
- [Step 4: Show calculation and cost details \(p. 21\)](#)
- [Step 5: View and add a Windows Server and SQL Server on Amazon EC2 estimate \(p. 22\)](#)

Step 1: Choose your licensing and tenancy recommendation

The AWS Pricing Calculator includes a licensing and tenancy recommendations section. This section of the calculator simplifies the complex Windows Server and SQL Server licensing rules into several inputs, and recommends an AWS tenancy for your workload. In this section, you enter your license details to determine your cost-optimized tenancy qualifications. For more information, see [Licensing and tenancy recommendations \(p. 24\)](#).

Some variables include:

- Whether your Windows Server license was purchased before or after October 1, 2019
- Whether your SQL Server license was purchased before or after October 1, 2019
- Whether you want to bring your own license (BYOL), or you have active Software Assurance for SQL Server licenses

If you don't choose a preference for Windows Server or SQL Server, the calculator assumes the LI scenario which will not utilize the existing licenses for cost savings.

Determine your licensing and tenancy recommendation
Specify your licensing scenario to determine your tenancy qualifications. The tenancy determines if compute resources are shared or in physical isolation in AWS.

Licensing and tenancy recommendation [Info](#)

Windows Server

I want to know if I can bring my own licenses (BYOL) to AWS.
Select to determine if you can bring your own license (BYOL) for Windows Server and estimate the costs.

Licenses purchase date

The licenses were purchased prior to October 1, 2019 or purchased as a true-up under an active enterprise agreement effective before October 1, 2019.

The licenses were purchased on or after October 1, 2019.

I don't know when the licenses were purchased.

SQL Server

I want to know if I can bring my own licenses (BYOL) to AWS.
Select to determine if you can bring your own license (BYOL) for SQL Server and estimate the costs.

I have active Software Assurance for SQL Server licenses.
Deselect if you do not have Software Assurance for SQL Server. [Learn more](#)

Licenses purchase date

The licenses were purchased prior to October 1, 2019 or purchased as a true-up under an active enterprise agreement effective before October 1, 2019 (and have not been upgraded to SQL Server 2019).

The licenses were purchased on or after October 1, 2019.

I don't know when the licenses were purchased.

Licensing and tenancy recommendation

Amazon EC2 Dedicated Hosts
Amazon EC2 Dedicated Hosts are required for Windows Server licenses. Without Software Assurance, Amazon EC2 Dedicated Hosts are required to bring SQL Server licenses. Both licenses must also be purchased before October 1, 2019. Based on your selection, costs will be calculated as BYOL running on Amazon EC2 Dedicated Hosts. [Learn more](#)

Example Example

This example uses the following options:

- Microsoft Windows Server License Included
- Microsoft SQL Server BYOL

For SQL Server BYOL, you must have active Microsoft Software Assurance associated.

To determine your licensing and tenancy recommendations for this example

1. In the [AWS Pricing Calculator console](#), clear the **Windows Server** check box.
2. Under **SQL Server**, select both options (the estimate for Windows LI and SQL BYOL licensing model).
3. Keep the default selection of the shared tenancy.

You will notice that the recommended tenancy options are **Shared** and **Dedicated Hosts**. You can use the [Amazon EC2 Dedicated Hosts calculator](#) to estimate Dedicated Host tenancy.

The screenshot shows the 'Licensing and tenancy recommendation' section of the AWS Pricing Calculator. It is divided into three main areas:

- Windows Server:** A checkbox labeled 'I want to know if I can bring my own licenses (BYOL) to AWS.' is currently unchecked. Below it is a small text: 'Select to determine if you can bring your own license (BYOL) for Windows Server and estimate the costs.'
- SQL Server:** A checkbox labeled 'I want to know if I can bring my own licenses (BYOL) to AWS.' is checked. Below it is a small text: 'Select to determine if you can bring your own license (BYOL) for SQL Server and estimate the costs.' Another checked checkbox is labeled 'I have active Software Assurance for SQL Server licenses.' Below it is a small text: 'Deselect if you do not have Software Assurance for SQL Server. Learn more [link]'.
- Licensing and tenancy recommendation:** A heading followed by the text: 'You qualify to run SQL Server on either Amazon EC2 shared tenancy or Amazon EC2 Dedicated Host. Choose the tenancy you would like to calculate.' Below this are two radio button options:
 - Amazon EC2 shared tenancy:** This option is selected (radio button is filled). Below it is a small text: 'Select to calculate costs for running Linux or Windows Server (AWS license included) and SQL Server (BYOL) on Amazon EC2 shared tenancy. Learn more'.
 - Amazon EC2 Dedicated Hosts:** This option is not selected (radio button is empty). Below it is a small text: 'Select to calculate costs for running Linux or Windows Server (AWS license included) and SQL Server (BYOL) on Amazon EC2 Dedicated Hosts. Learn more'.

Step 2: Configure your machine specifications

In this step, you provide machine specifications from the [Example scenario table \(p. 16\)](#) to configure your specifications in AWS Pricing Calculator. You enter the machine specs under **Configure machine specifications**.

To specify your machine specifications for this example

1. In the [AWS Pricing Calculator console](#), for **Machine description**, keep the name as **Server 1**.
2. For **Operating system**, choose **Windows Server**.
3. For **SQL Server edition (BYOL)**, choose **SQL Server Enterprise**.
4. Under **Storage volumes per specifications**, enter the storage amount (GiB) as **5000**, and **IOPS** as **60000**. For more information, see [Machine specifications details \(p. 18\)](#).
5. For **Amazon EC2 instance type**, choose the AWS instance recommendation. For more information, see [Amazon EC2 instance type details \(p. 19\)](#).
6. For **Optimize vCPU**, keep the optimize CPU value as 16. For more information, see [Benefits of Optimize vCPUs \(p. 20\)](#).
7. For **Quantity**, enter **10**.
8. For number of passive instances, choose **5**.
9. Choose **Add machine** to add more machine specification types. For this example, add the remaining three workloads from the [Example scenario table \(p. 16\)](#).

Machine specifications details

If you enter the storage size (GB) only, the calculator provides you with the most cost effective Amazon Elastic Block Store (Amazon EBS) storage option by default. If you enter a value between **16000** and **64000** for IOPS, the AWS Pricing Calculator recommends the io2 EBS volume type. Anything value beyond that range, AWS Pricing Calculator recommends io2 Block Express with tiered pricing. For more information, see [Amazon EBS volume types](#).

AWS Pricing Calculator User Guide Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator

▼ Machine specification 1

Remove machine specification

Machine description
Server 1
Max 256 characters

Operating system
Based on your licensing selections, Windows Server will be calculated as license included.
Windows Server

SQL Server edition (BYOL)
Based on your licensing selections, SQL Server will be calculated as BYOL on shared tenancy.
SQL Server Enterprise

Storage volumes per specification - optional Info

Storage amount (GB) IOPS Throughput (MiB/s) Volume type

5000 60000 Enter throughput - optional Provisioned IOPS SSD (io2) Remove

Add new volume

Amazon EC2 instance type details

You can choose **Obtain an Amazon EC2 instance type recommendation** for the server type specifications. AWS recommendations always default to the latest, cost-optimized instances for Windows Server and SQL Server workloads.

Amazon EC2 instance type Info
Select an Amazon EC2 instance type. You can choose to obtain a recommended instance type or search for a specific Amazon EC2 instance.

Obtain an Amazon EC2 instance type recommendation
Enter machine details, and Windows Server and SQL Server on Amazon EC2 calculator will recommend the lowest cost instance type.

Search for an Amazon EC2 instance type
Search all available Amazon EC2 instances.

Number of vCPUs Info
Enter the number of virtual machine CPUs for your machine.
16

Memory (GiB)
Enter your memory size requirement to find the lowest cost instance for your needs.
800

Recommended instance type
Based on your inputs, this is the recommended EC2 instance. Search for an EC2 instance type to choose a different instance.

x1e.8xlarge		
On-Demand hourly cost 8.144	vCPUs 32	GPUs 91
1YR Std reserved hourly cost 5.584	Memory (GiB) 976	Network performance Up to 10 Gigabit
Instance category Memory optimized		

You can also choose **Search** for an Amazon EC2 instance type if you want the ability to filter the instance types. You can filter by instance category, memory, CPU, and other options.

AWS Pricing Calculator User Guide

Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator

Amazon EC2 instance type Info
Select an Amazon EC2 instance type. You can choose to obtain a recommended instance type or search for a specific Amazon EC2 instance.

Obtain an Amazon EC2 instance type recommendation
Enter machine details, and Windows Server and SQL Server on Amazon EC2 calculator will recommend the lowest cost instance type.

Search for an Amazon EC2 instance type
Search all available Amazon EC2 instances.

EC2 Instances (70)
Selected Instance: **r5.xlarge**

Search by instance name or filter by keyword

vCPUs: Any vCPUs | Memory (GiB): 32 GiB | Network performance: Any Network Performance | Instance category: Memory optimized

Show only current generation instances.

Instance name	Memory	vCPUs	Network Perf...	Storage	On-Demand Hourly Cost
<input type="radio"/> r5a.xlarge	32 GiB	4	Up to 10 Gigabit	EBS only	0.41
<input checked="" type="radio"/> r5.xlarge	32 GiB	4	Up to 10 Gigabit	EBS only	0.436
<input type="radio"/> r5ad.xlarge	32 GiB	4	Up to 10 Gigabit	1 x 150 NVMe SSD	0.446
<input type="radio"/> r5d.xlarge	32 GiB	4	Up to 10 Gigabit	1 x 150 NVMe SSD	0.472
<input type="radio"/> r5b.xlarge	32 GiB	4	Up to 10 Gigabit	EBS only	0.482
<input type="radio"/> r5n.xlarge	32 GiB	4	Up to 25 Gigabit	EBS only	0.482
<input type="radio"/> r5dn.xlarge	32 GiB	4	Up to 25 Gigabit	1 x 150 NVMe SSD	0.518
<input type="radio"/> z1d.xlarge	32 GiB	4	Up to 10 Gigabit	1 x 150 NVMe SSD	0.556
<input type="radio"/> r5a.2xlarge	64 GiB	8	Up to 10 Gigabit	EBS only	0.82
<input type="radio"/> r5.2xlarge	64 GiB	8	Up to 10 Gigabit	EBS only	0.872

Benefits of Optimize vCPUs

You have the flexibility to specify a custom number of vCPUs while using the same memory, storage, and bandwidth of a full-sized instance. This means that BYOL customers can optimize vCPU-based licensing costs.

Even though the CPU optimized instance has the same price as the instance that is not optimized for CPU, it offers flexibility to choose the CPU count, so you can bring the right SQL Server license to avoid extra costs. For example, an `x1e.8xlarge` instance has 32 vCPUs by default. But you can specify `x1e.8xlarge` with Optimize CPU value to 16, 14, or 12.

The passive SQL Server nodes allow for additional cost optimization. A passive SQL Server node does not serve SQL Server data or run active SQL Server workloads. If you bring SQL Server to AWS with Software Assurance, you aren't required to license SQL Server on a passive node.

Step 3: Choose a pricing strategy

In this step, you use the pricing strategy section in AWS Pricing Calculator to choose a pricing model.

1. In the [AWS Pricing Calculator console](#), under **Pricing model**, choose **Standard Reserved Instance**.
2. Under **Reservation term**, choose **1 year**.
3. Under **Payment options**, choose **No Upfront**.

Pricing strategy Info

Pricing model

- Standard Reserved Instances (Save up to 75%)
- Amazon EC2 Instance Savings Plans (Save up to 72%)
- Convertible Reserved Instances (Save up to 54%)
- Compute Savings Plans
- On-Demand Instances

Reservation term

- 1 Year
- 3 Year

Payment options

- No Upfront
- Partial Upfront
- Full Upfront

This is a default pricing strategy that offers up to 75 percent savings over On-Demand pricing. For more information, see [Amazon EC2 pricing](#).

Step 4: Show calculation and cost details

At this stage in the tutorial, you see the results for your cost estimates.

In the [AWS Pricing Calculator console](#), choose the arrow next to **Show calculations** to expand the section.

▼ Show calculations

Instance costs

Machine specification 1
x1e.8xlarge
Pricing calculations
EC2 Standard Reserved unit instance rate for x1e.8xlarge in the US East (Ohio) is 4076.32 USD (monthly reserved cost)
10 instances x 5.584 USD x 730 hours in a month = 40,763.20 USD (monthly reserved cost)

Machine specification 2
m5.4xlarge
Pricing calculations
EC2 Standard Reserved unit instance rate for m5.4xlarge in the US East (Ohio) is 890.60 USD (monthly reserved cost)
8 instances x 1.22 USD x 730 hours in a month = 7,124.80 USD (monthly reserved cost)

Machine specification 3
c5.2xlarge
Pricing calculations
EC2 Standard Reserved unit instance rate for c5.2xlarge in the US East (Ohio) is 424.86 USD (monthly reserved cost)
10 instances x 0.582 USD x 730 hours in a month = 4,248.60 USD (monthly reserved cost)

Machine specification 4
r5.xlarge
Pricing calculations
EC2 Standard Reserved unit instance rate for r5.xlarge in the US East (Ohio) is 250.39 USD (monthly reserved cost)
8 instances x 0.343 USD x 730 hours in a month = 2,003.12 USD (monthly reserved cost)

Amazon EC2 Reserved instances (monthly): 54,139.72 USD

Storage costs

Machine specification 1
Provisioned IOPS SSD (io2)
Volume 1:
5,000 GB x 0.125 USD x 1 volumes x 10 instances = 6,250.00 USD (EBS Storage Cost)
32,000 iops x 0.065 USD x 1 volumes x 10 instances = 20,800.00 USD (EBS IOPS Cost)
28,000 iops x 0.0455 USD x 1 volumes x 10 instances = 12,740.00 USD (EBS IOPS Cost)
6,250.00 USD + 20,800.00 USD + 12,740.00 USD = 39,790.00 USD (Total EBS Storage Cost)

Expand the **Cost details** section to see the EC2 instance, storage, and BYOL SQL license details.

AWS Pricing Calculator User Guide Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator

Cost details
A breakdown of your cost details.

EC2 Instance costs
Region: US East (Ohio) < 1 > ⌂

Machine specification	Hourly cost (USD)	Monthly cost (USD)	First 12 months (USD)
1: Server 1	55.84	40763.20	489158.40
2: Server 2	9.76	7124.80	85497.60
3: Server 3	5.82	4248.60	50983.20
4: Server 4	2.744	2003.12	24037.44

Amazon Elastic Block Storage (EBS) costs
Region: US East (Ohio) < 1 > ⌂

Machine specification	Storage volume type	Monthly cost per unit (USD)	Monthly cost (USD)	First 12 months (USD)
1: Server 1	Provisioned IOPS SSD (io2)	3979.00	39790.00	477480.00
2: Server 2	General Purpose SSD (gp3)	300.00	2400.00	28800.00
3: Server 3	General Purpose SSD (gp3)	80.00	800.00	9600.00
4: Server 4	General Purpose SSD (gp3)	40.00	320.00	3840.00

SQL Server bring your own license summary
The number of cores for your BYOL SQL Server licenses.

SQL Server Standard (cores) 64	SQL Server Enterprise (cores) 80	SQL Server Web (cores) 80
-----------------------------------	-------------------------------------	------------------------------

Step 5: View and add a Windows Server and SQL Server on Amazon EC2 estimate

In this step of the tutorial, you see a total monthly cost for all four workloads.

In the [AWS Pricing Calculator console](#), choose **Add to my estimate** to be directed to your **My estimate** page. On your **My estimate** page, you can view your annual total. Here, you have the option to choose **Save and share** to generate a public URL for your estimate.

At this point, you've successfully estimated workload costs for Windows Server License Included (LI) and SQL Server Bring Your Own License (BYOL) licensing. You can clone your existing estimate to generate an estimate for the LI option for SQL Server.

1. In the **Services** section, choose **Action**, and then choose **Clone service**.
2. Choose **Edit** on the cloned estimate.
3. For the description, enter **Workload_LI**.
4. Keep the **Region** as is.
5. In the **Licensing and tenancy recommendation** section, keep the **Windows Server** and **SQL Server** check boxes cleared.

AWS Pricing Calculator User Guide Tutorial: Using Windows Server and SQL Server on Amazon EC2 calculator

Description
Workload_LI

Region Info
It is a physical location around the world where AWS clusters data centers.
US East (Ohio)

Determine your licensing and tenancy recommendation
Specify your licensing scenario to determine your tenancy qualifications. The tenancy determines if compute resources are shared or in physical isolation in AWS.

Licensing and tenancy recommendation Info

Windows Server
 I want to know if I can bring my own licenses (BYOL) to AWS.
Select to determine if you can bring your own license (BYOL) for Windows Server and estimate the costs.

SQL Server
 I want to know if I can bring my own licenses (BYOL) to AWS.
Select to determine if you can bring your own license (BYOL) for SQL Server and estimate the costs.

Licensing and tenancy recommendation

Amazon EC2 shared tenancy
Based on your selection, all costs will be calculated as AWS license included on Amazon EC2 shared tenancy. [Learn more](#)

You may save costs by bringing your own licenses (BYOL). [Learn more](#)

6. For the SQL Server section, review and adjust the machine specifications.
7. Review the new monthly cost estimate and aggregated monthly costs.
8. Choose **Save**.

On the **My Estimate** page, you can now compare the price under both the licensing options. In this example, the shared tenancy with Windows LI and SQL Server BYOL option is approximately half of the cost of shared tenancy with Windows LI and SQL Server LI.

We offer several cost saving programs that can lower the price of running your Windows workloads on AWS. For more information, choose **Learn more**.

Successfully updated Windows Server and SQL Server on Amazon EC2 estimate. [Learn more](#)

My Estimate Info [Add service](#) [Add support](#) [Add group](#) [Clear estimate](#) [Action](#) [Save and share](#)

Contact Sales
You might be able to further optimize your architecture and spend. To discuss your options, [contact sales](#)

First 12 months total	Total upfront	Total monthly
3,536,372.88 USD	0.00 USD	294,697.74 USD

Services (2)

Windows Server and SQL Server on Amazon EC2 [Edit](#) [Action](#)

Description: Workload_LI
Region: US East (Ohio)

Configuration	Monthly
EC2 Windows LI with SQL Server Enterprise LI (x1e.8xlarge x 10), EC2 Windows LI with SQL Server Standard LI (m5.4xlarge x 8), EC2 Windows LI with SQL Server Web LI (c5.2xlarge x 10), EC2 Windows LI (r5.xlarge x 8), EBS io2 (10 volumes, 5000 GiB), EBS gp3 (26 volumes, 4500 GiB)	197,248.02 USD

Windows Server and SQL Server on Amazon EC2 [Edit](#) [Action](#)

Description: Workload_SQL_BYOL
Region: US East (Ohio)

Configuration	Monthly
EC2 Windows LI with SQL Server Enterprise BYOL (x1e.8xlarge x 10), EC2 Windows LI with SQL Server Standard BYOL (m5.4xlarge x 8), EC2 Windows LI with SQL Server Web BYOL (c5.2xlarge x 10), EC2 Windows LI (r5.xlarge x 8), EBS io2 (10 volumes, 5000 GiB), EBS gp3 (26 volumes, 4500 GiB)	97,449.72 USD

Next steps

- AWS Optimization and Licensing Assessment**
Take advantage of a free program, AWS Optimization and Licensing Assessment (AWS OLA), to save on third party licensing costs and run your resources more efficiently. [Learn more](#)
- End-of-Support Migration Program**
AWS helps customers migrate their legacy Windows Server applications to the latest, supported versions of Windows Server on AWS, without any code changes. AWS offers the End-of-Support Migration Program (EMP) for Windows Server. [Learn more](#)
- AWS Migration Acceleration Program**
The AWS Migration Acceleration Program (MAP) for Windows is designed to help organizations reach their migration goals faster with AWS services, best practices, tools, and incentives. [Learn more](#)

You've now completed the tutorial for using the Microsoft Windows Server and Microsoft SQL Server to generate a pricing estimate.

Licensing and tenancy recommendations

You can determine your AWS licensing and tenancy options for your workload through your choices for Windows Server and SQL Server licensing inputs. The licensing options include AWS provided licenses with License Included (LI) offerings, and your existing licenses with Bring Your Own License (BYOL) offerings for optimal cost savings. You can identify the most suitable cloud tenancy, for example, Shared tenancy or Dedicated Hosts.

AWS licensing and tenancy scenarios supported by AWS Pricing Calculator

Windows Server	SQL Server	AWS tenancy
LI	LI	Shared tenancy
LI	BYOL	Shared tenancy or Dedicated Hosts
BYOL	BYOL	Dedicated Hosts
BYOL	LI	Not supported

Configuring machine specifications

Based on your choice of machine specification, we recommend the Amazon EC2 instance that AWS Pricing Calculator uses to generate an estimate for your cost. You can also select different instances than the one recommended, or add multiple machine specifications for a workload.

This section defines the terms mentioned in the **Configure machine specifications** section.

Machine description

A description for the machine. This is generally a hostname identifier. If unknown, you can specify unique software components running on this machine—for example, `WebApp DB1`, `Webserver 1`.

Operating system

You can choose an operating system with a licensing option, depending on your tenancy qualification. The default value is `Windows`.

SQL Server edition

You can choose a SQL Server with licensing option, depending on your tenancy qualification. The default value is `SQL Standard`.

Storage volumes per specification

You can specify the storage needs in this section. If you don't know storage needs upfront, you can remove it from the estimate using **Remove**. This section is optional.

Instances can have zero or more storage volumes associated. Choose **Add new volume** to add multiple volumes to an instance.

You can use different volume types for each volume. The calculator recommends the appropriate Amazon EBS storage type based on the optional inputs such as **IOPS** and **Throughput**.

Storage amount

You can specify your storage amount needs. The default value is 1000 GB. If only storage amount is specified, the default recommended Amazon EBS storage type is `General Purpose SSD (gp3)`.

IOPs

IOPS (input/output operations per second) is the standard unit of measurement for the maximum number of reads and writes to non-contiguous storage locations. IOPS describes performance in solid state drives (SSD), hard disk drives (HDD) and storage area networks.

You can specify IOPs for I/O intensive workloads. AWS uses this value to potentially recommend `io2` Amazon EBS storage types.

`io2` delivers a consistent baseline performance of up to 500 IOPS/GB to a maximum of 64,000 IOPS, and provides up to 1,000 MB/s of throughput per volume.

Throughput

Throughput measures how many units of information a system can process in a period of time. It can refer to the number of I/O operations per second, but is typically measured in bytes per second.

You can specify this input for throughput-intensive workloads.

`st1` is backed by hard disk drives. It's ideal for frequently accessed, throughput-intensive workloads with large datasets and large I/O sizes. Examples include MapReduce, Kafka, and log processing.

EC2 instance type

Obtain an EC2 instance type recommendation

This is the default choice. Choose the number of vCPUs and memory inputs to generate an EC2 instance recommendation. Only x86 architecture instances are considered. The default vCPU value is 4, and memory is 16 GB.

Search for an EC2 instance type

You can use this option to choose different instance types than the recommended instance.

To find an instance, search by minimum requirements or by name. Minimum requirements are the most useful when you know the specification of the instances you prefer. Instance names are useful when you know the instance family or size of the instance you prefer. For example, you can search for an instance with a minimum of 4 vCPUs and 16 GB memory, or for an `m5` instance name.

You can also search instances by using filters like *instance category*. For example, memory-optimized instances are recommended for database workload, and they can be retrieved using the instance category filter.

Optimize CPU

You have the flexibility of specifying a custom number of vCPUs while using the same memory, storage, and bandwidth of a full sized instance. The default value is the same as the vCPU input specified for the machine specification.

For example, a `x1e.4xlarge` instance currently offers 16 vCPUs by default, but you can specify `x1e.4xlarge` with 4, 5, 6, 7, 8, 9, 10, 12, 14 Optimize vCPUs. This means BYOL customers can optimize vCPU-based licensing costs. The CPU optimized instance has the same price as the instance that is not optimized for CPU.

Quantity

The default value is 1, which is the minimum number required.

SQL passive node

A passive SQL Server node is one that is not serving SQL Server data to clients or running active SQL Server workloads. If you select this check box, if you bring SQL Server 2014 and later versions to AWS with Software Assurance, you are not required to license SQL Server on a passive node.

Pricing strategy

Your choices in the **pricing strategy** section determine the pricing strategy AWS Pricing Calculator uses to generate your estimate.

Pricing model

The pricing model determines whether you are searching for a pay-as-you-use instance, or an instance that you can reserve in advance. For Reserved Instance (RI) payment options, see **payment options**.

The default value is `Standard Reserved Instances`, because it is the most common Amazon EC2 purchase, and offers the flexibility with highest discount for most use cases.

Reservation term

You purchase a reservation for the period of your contract when you reserve an RI. Choose either 1 or 3 years for your term. The default is set to 1 year, to save no costs.

Payment options

Payment options determine when you pay for your RI reservation.

Full upfront - You pay for the entire reservation upfront, resulting in a single payment but no monthly, recurring payments. This option provides the best discount.

Partial upfront - You pay for a smaller, partial upfront fee along with monthly payments.

No upfront - You only pay on a monthly basis.

The default value is **No upfront**, because it gives you the least costly start-up price.

Cost details

The cost details section provides details for your workload.

EC2 Instance costs

A summary of the itemized breakdown for an EC2 instance. Pause on each row to show additional information, such as instance type, operating system, SQL version, vCPU, memory, quantity, optimize CPU, and SQL passive node.

Amazon EBS costs

The itemized cost breakdown for Amazon EBS.

SQL bring your own license summary

A summary to clarify the number of cores for your BYOL SQL Server licenses.

Generating AWS Support estimates

You can add AWS Support cost to your estimates using the AWS Pricing Calculator. By choosing an AWS Support plan, the AWS Support cost calculation is automatically updated in your total estimate amount. After you save your AWS Support cost estimates, this amount is added to your total estimation saves.

You can select your AWS Support by directly choosing your preferred support plan, or by answering the questions provided to generate recommendations that match your AWS Support needs.

You can edit your AWS Support plan like any other service configuration within the calculator.

Topics

- [Generating AWS Support estimates using recommendations \(p. 27\)](#)
- [Generating AWS Support estimates without using recommendations \(p. 27\)](#)

Generating AWS Support estimates using recommendations

You can use the provided questions to narrow your AWS Support plan to match your needs.

To generate AWS Support estimates using recommendations

1. Go to **My Estimate** at <https://calculator.aws/#/estimate>.
2. Choose **Add support**.
3. Under **Enhanced technical support**, choose your preferred interaction with AWS Support.
4. Under **High severity response times**, choose your preferred response time to critical system issues.
5. Under **Support recommendation**, select your preferred available option.

Options that don't match your preferences are displayed in gray and can't be selected.

6. (Business support plan only) Under **Business spend**, choose the range of how much your business spends on average for AWS services each month.
7. (Enterprise support plan only) Under **Enterprise spend**, choose the range of how much your enterprise spends on average for AWS services each month.
8. Choose **Add to my estimate**.
9. (Business and Enterprise plan only) In the pop-up window, choose **Confirm**.

Generating AWS Support estimates without using recommendations

You can directly choose your preferred AWS Support plan and add to your estimates.

To generate AWS Support estimates without using recommendations

1. Go to **My Estimate** at <https://calculator.aws/#/estimate>.
2. Choose **Add support**.
3. Under **Support recommendation**, select your preferred available option.
4. (Business support plan only) Under **Business spend**, choose the range of how much your business spends on average for AWS services each month.
5. (Enterprise support plan only) Under **Enterprise spend**, choose the range of how much your enterprise spends on average for AWS services each month.
6. Choose **Add to my estimate**.
7. (Business and Enterprise plan only) In the pop-up window, choose **Confirm**.

Saving and sharing your estimate

You can save each estimate's unique link to share or revisit directly through your browser. Estimates are saved to AWS public servers.

Any changes that you make to an estimate requires you to save again. AWS Pricing Calculator doesn't save automatically.

Each time that you save an estimate, the system generates a unique link. If you don't copy and save the newly generated link, you can't access any saved changes.

Topics

- [Creating an estimate link \(p. 28\)](#)
- [Creating a new link for updated estimates \(p. 28\)](#)
- [Creating a new link for an existing estimate \(p. 28\)](#)

Creating an estimate link

To create an estimate and share the results, save the estimate and copy the generated link.

To create your public save link

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.
2. Choose **Create estimate**.
3. For **Save estimate**, read the **Public server acknowledgment** and choose **Agree and Continue**.
4. Choose **Copy public link** to save your generated link.

Creating a new link for updated estimates

If you have updates to an existing estimate, you must make the changes and save to regenerate a new estimate link.

To update your estimate and generate a new link

1. To open your saved estimate, copy your unique link into your browser's navigation bar.
2. From the **Estimate** page, find the service that you want to modify and choose **Edit**.
3. Make your changes and choose **Save** to return to the **Estimate** page.
4. To save the estimate, choose **Save**.
5. To save the new link for your updated estimate, choose **Copy public link**.

Creating a new link for an existing estimate

You can generate new links for existing estimates.

To create a new link to your estimate

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.

2. For **Action**, choose **Share estimate**.
3. For **Save estimate**, read the **Public server acknowledgment** and choose **Agree and Continue**.
4. To save the new link, choose **Copy public link**.

Exporting estimates

You can export your AWS Pricing Calculator estimate as a CSV file. This enables you to save the parameters that AWS Pricing Calculator used to create your estimate so that you can revisit them if you decide to set up AWS services.

To export an AWS Pricing Calculator estimate

1. Open AWS Pricing Calculator at <https://calculator.aws/#/>.
2. On the **My estimate** page, on the banner, choose **Action**.
3. From the **Action** dropdown, choose **Export**.
4. In the dialog box, choose **Save File** and choose **OK**.

Security in AWS Pricing Calculator

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture that is built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between AWS and you. The [shared responsibility model](#) describes this as security *of* the cloud and security *in* the cloud:

- **Security of the cloud** – AWS is responsible for protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also provides you with services that you can use securely. Third-party auditors regularly test and verify the effectiveness of our security as part of the [AWS Compliance Programs](#). To learn about the compliance programs that apply to AWS Pricing Calculator, see [AWS Services in Scope by Compliance Program](#).
- **Security in the cloud** – Your responsibility is determined by the AWS service that you use. You are also responsible for other factors including the sensitivity of your data, your company's requirements, and applicable laws and regulations.

AWS Pricing Calculator is a public interface. The information you provide isn't stored, and AWS does not collect your input or associate your input with an AWS account.

Topics

- [Data protection in AWS Pricing Calculator \(p. 31\)](#)
- [Compliance validation for AWS Pricing Calculator \(p. 32\)](#)

Data protection in AWS Pricing Calculator

The AWS [shared responsibility model](#) applies to data protection in AWS Pricing Calculator. As described in this model, AWS is responsible for protecting the global infrastructure that runs all of the AWS Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. This content includes the security configuration and management tasks for the AWS services that you use. For more information about data privacy, see the [Data Privacy FAQ](#). For information about data protection in Europe, see the [AWS Shared Responsibility Model and GDPR](#) blog post on the *AWS Security Blog*.

For data protection purposes, we recommend that you protect AWS account credentials and set up individual user accounts with AWS Identity and Access Management (IAM). That way each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources. We recommend TLS 1.2 or later.
- Set up API and user activity logging with AWS CloudTrail.
- Use AWS encryption solutions, along with all default security controls within AWS services.
- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing personal data that is stored in Amazon S3.
- If you require FIPS 140-2 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see [Federal Information Processing Standard \(FIPS\) 140-2](#).

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form fields such as a **Name** field. This includes when

you work with AWS Pricing Calculator or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into tags or free-form fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

Compliance validation for AWS Pricing Calculator

Third-party auditors assess the security and compliance of AWS Pricing Calculator as part of multiple AWS compliance programs. AWS Pricing Calculator is not in scope of any AWS compliance programs.

For a list of AWS services in scope of specific compliance programs, see [AWS Services in Scope by Compliance Program](#). For general information, see [AWS Compliance Programs](#).

Your compliance responsibility when using AWS Pricing Calculator is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. AWS provides the following resources to help with compliance:

- [Security and Compliance Quick Start Guides](#) – These deployment guides discuss architectural considerations and provide steps for deploying security- and compliance-focused baseline environments on AWS.
- [AWS Compliance Resources](#) – This collection of workbooks and guides might apply to your industry and location.
- [Evaluating Resources with Rules](#) in the *AWS Config Developer Guide* – The AWS Config service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- [AWS Security Hub](#) – This AWS service provides a comprehensive view of your security state within AWS that helps you check your compliance with security industry standards and best practices.

Resources

The following related resources can help you as you work with this service.

Service-specific resources

Each AWS service has its own documentation that can help you understand the service.

- [Amazon Elastic Compute Cloud documentation](#) – Provides the documentation for using Amazon Elastic Compute Cloud (Amazon EC2).
- [Elastic Load Balancing documentation](#) – Provides the documentation for using Elastic Load Balancing.
- [Amazon Elastic Block Store documentation](#) – Provides the documentation for using Amazon Elastic Block Store.

General AWS resources

AWS provides several helpful guides, forums, contact info, and other resources for you.

- [AWS Developer Resource Center](#) – Provides a central starting point to find documentation, code samples, release notes, and other information to help you build innovative applications with AWS.
- [AWS Training and Courses](#) – Links to role-based and specialty courses and self-paced labs to help sharpen your AWS skills and gain practical experience.
- [AWS Developer Tools](#) – Links to developer tools and resources that provide documentation, code samples, release notes, and other information to help you build innovative applications with AWS.
- [AWS Support Center](#) – The hub for creating and managing your AWS Support cases. Also includes links to other helpful resources, such as forums, technical FAQs, service health status, and AWS Trusted Advisor.
- [AWS Support](#) – The primary web page for information about AWS Support, a one-on-one, fast-response support channel to help you build and run applications in the cloud.
- [Contact Us](#) – A central contact point for inquiries concerning AWS billing, your account, events, abuse, and other issues.
- [AWS Site Terms](#) – Detailed information about our copyright and trademark; your account, license, and site access; and other topics.

Document history for User Guide

The following table describes the documentation for this release of AWS Pricing Calculator.

- **Latest documentation update:** Dec 16, 2019

update-history-change	update-history-description	update-history-date
New save and share feature (p. 34)	Added the Saving and Sharing Your Estimate section.	December 16, 2019
UI update (p. 34)	Updated the UI to enable nested groups.	December 17, 2018
Initial launch (p. 34)	First publication of the documentation.	October 23, 2018

AWS glossary

For the latest AWS terminology, see the [AWS glossary](#) in the *AWS General Reference*.