# AWS Pricing Calculator

## User Guide

# AWS Pricing Calculator: User Guide

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# What is AWS Pricing Calculator?

AWS Pricing Calculator is a web-based planning tool that you can use to create estimates for your AWS use cases. You can use it to model your solutions before building them, explore the AWS service price points, and review the calculations behind your estimates. You can use it to help you plan how you spend, find cost saving opportunities, and make informed decisions when using Amazon Web Services.

AWS Pricing Calculator is useful for those who have never used AWS. It's also useful for those 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.

AWS Pricing Calculator is available through a web-based console at https://calculator.aws/#/ .

## Features of AWS Pricing Calculator

With AWS Pricing Calculator, you can do the following tasks:

- **View transparent prices** – See the calculations behind the estimated prices for your service configurations. You can view price estimates by service or by groups of services to analyze your architecture costs.
- **Use groups for hierarchical estimates** – Sort your estimates into groups to align with your architecture for clear service cost analysis.
- **Share your estimates** – Save the link to each estimate to share or revisit at a later time. Estimates are saved to the AWS public servers.
- **Export your estimates** – Export your estimates in CSV or PDF format to share locally with your stakeholders.

## Pricing for AWS Pricing Calculator

AWS Pricing Calculator is provided at no charge. It provides an estimate of your AWS fees and charges, but the estimate doesn't include any taxes that might apply. AWS Pricing Calculator provides pricing details for only the information you enter. If the prices on the marketing pages 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 User Guide.

## More AWS Pricing Calculator resources

Explore the following resources to learn more about AWS Pricing Calculator.

- AWS Pricing Calculator Frequently Asked Questions – Explore the FAQs that are listed in the AWS Marketing pages
- AWS Pricing Calculator pricing assumptions – Understand the disclaimers for AWS Pricing Calculator prices.
- AWS IQ – Connect with AWS certified experts on AWS IQ to get help with your estimations.

# Setting up AWS Pricing Calculator

Here is some general information about how to get started with AWS Pricing Calculator.

## 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 recommend 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 products to run on AWS, or by Regional stacks. Then, you can use the **Group** feature to organize your estimates.

## Accessing AWS Pricing Calculator

AWS Pricing Calculator is available through a web-based console at https://calculator.aws/#/ . Currently, there are no APIs available.

You can use the AWS Pricing Calculator to generate monthly cost estimates for all AWS Regions that are supported by your preferred services. To see which Regions are available for each service, see the corresponding service user guide documentation.

For estimating costs in the China Region, you can access the AWS Pricing Calculator at https://calculator.amazonaws.cn/.

# Getting started

This chapter gives a walk-through of the AWS Pricing Calculator feature to help you understand how to use AWS Pricing Calculator to generate estimates for your use cases.

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# Using the AWS Pricing Calculator console

The AWS Pricing Calculator consists of four major console pages.

**Landing page**

This page links to key resources. For example, this user guide, FAQs, and pricing assumptions.

Direct link: https://calculator.aws/#/

**Add Service page**

You navigated to the **Add Service** page when you begin creating an estimate. This page has calculators for all services that AWS Pricing Calculator supports. There's a calculator for each service, and a single calculator supports multiple services in some use cases. Use the search menu to enter service names or keywords. You can also find more information about each service through the **Product page** links.

Direct link: https://calculator.aws/#/addService

**Configure calculator page**

Use the configure calculator page to enter your customized details for your service calculator. Information includes a description (optional), choosing an AWS Region to create an estimate for, and other inputs for the service based on your use case. View your estimate results and review the calculations behind each estimate. You can add the estimate of your service to the **My estimates** page using the **Go to My Estimate** at the end of the page. To add more services to your estimate, choose **Continue adding service**.

Direct link (example): https://calculator.aws/#/createCalculator/Athena

You can directly navigate to individual service calculators.

**My estimate page**

**Estimate summary** section: This section shows your estimates in **Upfront cost**, **Monthly cost**, and your **Total 12 months cost**. The **total 12 months cost** is the sum of all estimates and groups. It combines the upfront and monthly costs. The upfront cost shows how much you're estimated to pay when you set up your services. Monthly costs are how much you're estimated to spend for ongoing months.

**Groups** and **My estimate** section: This is your working section that shows a list of your service calculators. You can add more services here, and use the search bar to enter keywords to find your previous service estimates.

On this page, you can export your estimates to CSV or PDF files, share your estimate links, and navigate to the AWS console to sign in or create an account.

Direct link: https://calculator.aws/#/estimate

> **Note**
> AWS provides the Free Tier that you can use to try some AWS services for free. The Free Tier only covers certain instances or usage for a limited amount of time. Free Tier isn't included in your AWS Pricing Calculator estimates unless it's specifically called out otherwise. AWS Pricing Calculator assumes that you aren't using the Free Tier and doesn't include any expiring Free Tier in your estimates.

# Create an estimate, configure a service, add more services, and edit your inputs

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 section shows 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. To get started, create your estimate using the following steps.

**To create your estimate**

1. Open AWS Pricing Calculator at https://calculator.aws/#/.
2. Choose **Create estimate**.
3. On the **Add service** page, find the service that you want to choose and then choose **Configure**. For more information, see Configure a service (p. 4).
4. Add a **Description** for the estimated service.
5. Choose a **Location type**.
6. Choose a **Region**.
7. Enter your values to configure a service estimate.
8. (Optional) To add more services to your estimate, choose **Save and add service**.
9. Choose **Save and view summary** to view your estimate details.

## Configure a service

This section shows how to configure a service you're creating an estimate for. In this example, we're adding Amazon EC2 using the Amazon EC2 **Quick estimate** option.

**To configure a service for your estimate**

1. Open the **Add service** page at https://calculator.aws/#/addService .
2. Enter **`Amazon EC2`** in the search bar and choose **Configure**.
3. In the **Description** field, enter a description for your estimate.
4. Choose a **Location type**.
5. Choose a **Region**.
6. The **Quick estimate** view is preloaded with default values, so you can see a starting estimate without adding or changing any information. You can change any of the values for the following parameters. Otherwise, you can also keep the defaults when they're applicable.

   - The operation system

- The Amazon EC2 instance: Search by instance name, or by filters (vCPU, Memory, ECU, and GPU parameters)
- The number of Amazon EC2 instances
- The utilization or expected usage of Amazon EC2 instances
- The pricing model
- The reservation term
- The payment options

7. (Optional) Choose **Show calculations** to view the calculations behind your estimate.
8. In the **Amazon EBS** section, choose the storage for each Amazon EC2 instance, and enter the storage amount.

   If you aren't adding Amazon EBS volumes, enter **0**.
9. (Optional) To add more services to your estimate, choose **Save and add service**.
10. Choose **Save and view summary** to view your estimate details.

# (Optional) Add a group

Use groups to organize services together. You can add one or more services to each group. You can also use groups to organize your estimate in different ways. For example, you can organize it by cost center, service stack, product architecture, or client.

For more information about groups, see Using groups to organize your estimates (p. 7).

**To add a group to your estimate**

1. Open the **My estimate** page at https://calculator.aws/#/estimate .
2. Choose **Create group**.
3. Enter a group name.
4. Choose **Create group**.

# Add more services

You can add more services to generate a complete estimate for your architecture. For process examples and tutorials that show estimates for specific services, see Estimate examples for services (p. 12).

**To add more services to your estimate**

1. Open the **My estimate** page at https://calculator.aws/#/estimate .
2. Choose a group from the left panel to add your service to.
3. Choose **Add service**.
4. Search for a service and choose **Configure**.
5. Enter your values to configure a service estimate.
6. (Optional) To add more services to your estimate, choose **Save and add service**.
7. Choose **Save and view summary** to view your estimate details.
8. Repeat as needed.

# Edit your inputs

You can edit the inputs for a service added to your estimate.

### To edit the inputs for a service

1. Open the **My estimate** page at https://calculator.aws/#/estimate .
2. Under the **My Estimate** section, locate the service you want to update and choose the **Edit** icon.
3. Edit your changes and choose **Update** to return to your **My Estimate** page.

# Best practice for generating estimates

This chapter outlines some best practices for generating your AWS Pricing Calculator estimates.

To get the most out of your estimates, make sure you have a good understanding of your base requirements. For example, if you're going to try Amazon Elastic Compute Cloud (Amazon EC2), we recommended that you know what kind of operating system you need, what your memory requirements are, and how much I/O you need. Before you begin, determine whether you need storage. For example, decide if you will run a database and how long you intend to use the servers that you will need. You can use the AWS Pricing Calculator service configuration and parameters to see which option meets your specific use case and budget.

When you generate your estimates, it's recommended you consider the following:

- How do you want to organize your estimates?
- Do you want to add an AWS Support plan?
- Will you need to access your estimates at a later time?

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# Using groups to organize your estimates

You can organize your AWS estimates by defining groups. A group can reflect how your company is organized, such as by providing estimates by cost center. Otherwise, it can reflect other organization methods, such as by product stack or product architecture. For example, assume that 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,. Then, you can generate another estimate for how much running a machine learning process might cost. By doing this, you can see the combined estimate for your AWS usage.

Groups are also useful to compare AWS Regions. By creating a group for each Region, you can compare the cost to run servers in two different locations. For example, you can generate an estimate for US East (N. Virginia) in one group and Asia Pacific (Seoul) for another. Then, you can compare your two estimates to meet your specific use case and budget.

## Create a group

Use groups to organize services together. You can add one or more services to each group. You can also use groups to organize your estimate in different ways. For example, you can organize your estimate by cost center, service stack, product architecture, or client.

**Note**
You can create up to five nested groups.

**To add a group to your estimate**

1. Open the **My estimate** page at https://calculator.aws/#/estimate .
2. Choose **Create group**.
3. Enter a group name.
4. Choose **Create group**.

## Moving groups

You can move your groups and services to organize your estimate. All sub-groups and services will be moved as a part of your action. You can move single or multiple groups using this process.

**To move a group**

1. Open the **My estimate** page at https://calculator.aws/#/estimate .
2. Select all of the groups and services to move using the checkboxes.
3. Choose **Move to**.
4. Choose the destination group from the dropdown.
5. Choose **Move**.

**Note**
You can't move AWS Support calculator into a group because estimates for your chosen support plans aren't specific to a group.

# Add AWS Support costs to your estimates

You can add AWS Support costs to your estimates using the AWS Pricing Calculator. You can either directly choose your preferred support plan, or complete the recommendations that match your usage needs. You can change your AWS Support within the calculator at any time.

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## 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. Open AWS Pricing Calculator at https://calculator.aws/#/.
2. Create an estimate by adding one or more services. For more information, see Create an estimate, configure a service, add more services, and edit your inputs (p. 4).
3. Open the **My estimate** page at https://calculator.aws/#/estimate .

4. Choose **Add support**.
5. (Optional) Enter a description for your support plan estimate.
6. Under **Enhanced technical support**, choose your preferred interaction with AWS Support.
7. Under **High severity response times**, choose your preferred response time to critical system issues.
8. Under **Support recommendation**, select your preferred available option.

   Options that don't match your preferences are displayed in gray and can't be selected.
   - (Business support plan only) Under **Business spend**, choose the range of how much your business spends on average for AWS services each month.
   - (Enterprise support plan only) Under **Enterprise spend**, choose the range of how much your enterprise spends on average for AWS services each month.
9. (Optional) Choose **Show calculations** to review the calculations behind the estimates.
10. Choose **Add to my estimate**.
11. (Business and Enterprise plan only) In the pop-up window, choose **Confirm**.

## Generating AWS Support estimates by choosing preferred plan

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

**To generate AWS Support estimates without using recommendations**

1. Open AWS Pricing Calculator at https://calculator.aws/#/.
2. Create an estimate by adding one or more services. For more information, see Create an estimate, configure a service, add more services, and edit your inputs (p. 4).
3. Open the **My estimate** page at https://calculator.aws/#/estimate .
4. Choose **Add support**.
5. Under **Support recommendation**, select your preferred available option.
   - (Business support plan only) Under **Business spend**, choose the range of how much your business spends on average for AWS services each month.
   - (Enterprise support plan only) Under **Enterprise spend**, choose the range of how much your enterprise spends on average for AWS services each month.
6. (Optional) Choose **Show calculations** to review the calculations behind the estimates.
7. Choose **Add to my estimate**.
8. (Business and Enterprise plan only) In the pop-up window, choose **Confirm**.

# Sharing your estimate

You can create a unique, public link for each estimate that you create. Use this link to share the estimate with stakeholders or access the estimate again at a later time. Estimates are saved to AWS public servers.

Any changes you make to an estimate requires you to save again. AWS Pricing Calculator doesn't automatically save to the same link to prevent unwanted overwrites. Alternatively, you can use the shared link as a template for common use cases, and use it as a starting point to build complex estimates.

> **Note**
> Make sure that you save your generated links because your estimates can't be accessed without them.

Generated links are not auto-saved with updates. If you make changes to an estimate, you must generate a new sharable link.
Public share links expire after three years.

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## Creating an estimate link

To create an estimate and share the results, generate a share link.

**To create your public share link**

1. Open AWS Pricing Calculator at https://calculator.aws/#/.
2. Create an estimate by adding one or more services. For more information, see Create an estimate, configure a service, add more services, and edit your inputs (p. 4).
3. Open the **My estimate** page at https://calculator.aws/#/estimate .
4. Choose **Share**.
5. Read the **Public server acknowledgment** and choose **Agree and Continue**.

   (Optional) You can select **Don't show me this again** for future visits.
6. Choose **Copy public link** to copy your generated link.

We recommend you document your shared links with a brief description of the estimate.

## Creating a new link for updated estimates

If you update an existing estimate, you must save the changes and regenerate a share 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 the **Edit** icon.
3. Make your changes and choose **Save** to return to the **Estimate** page.
4. Choose **Share** to generate a link to the estimate.

The changes made aren't saved to the original shared link, so you can return to the original link as needed.

# Exporting your estimates

You can export your AWS Pricing Calculator estimate as a PDF or a CSV file. By doing this, you can save the parameters that AWS Pricing Calculator used to create your estimate so that you can revisit them if you set up AWS services in the console.

**Note**
Your PDF contains a share link to your estimate.

**To export an AWS Pricing Calculator estimate**

1. Open AWS Pricing Calculator at https://calculator.aws/#/.
2. Create an estimate by adding one or more services. For more information, see Create an estimate, configure a service, add more services, and edit your inputs (p. 4).
3. Open the **My estimate** page at https://calculator.aws/#/estimate
4. Use the **Export** dropdown and choose `CSV` or `PDF`.
5. Read the acknowledgement and choose **OK**.
6. In the dialog box, choose **Save File** and choose **OK**.

# Estimate examples for services

This section provides examples and tutorials that show how you can use AWS Pricing Calculator to generate estimates for certain services.

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# 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. The detailed estimate can account for workload, data transfer costs, additional storage options, and other less common instance requirements.

Consider the following 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. However, she doesn't know how many hours she needs for the more flexible instances. Using the quick estimate path, she can generate an estimate for the Amazon EC2 instances that don't have the hourly snapshot requirement and for those that she doesn't know how many hours she needs. With the advanced estimate path, she can generate an estimate for the Amazon EC2 instances with an hourly snapshot requirement.

**To start an Amazon EC2 estimate**

1. Open the **Amazon EC2 estimate** page at https://calculator.aws/#/createCalculator/EC2 .
2. Enter the description for your Amazon EC2 estimate.
3. Choose the **Region** from the dropdown.
4. Choose either the **Quick** or **Advanced** estimate path.

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## Quick estimates

The quick estimate path provides a general estimate while requiring minimal information and parameters. Each parameter has a default setting. You can generate estimates even if you don't know what you want for the particular parameter. This way, you can get a rough idea of how much AWS might cost you even when you don't have all, or many, of the details of how you plan to use AWS.

The quick estimate path has the following sections and parameters:

- Adding an Amazon EBS estimate (p. 14)

**Note**
For a step-by-step tutorial on how to generate an Amazon EC2 estimate using the **Quick estimate** option, see Getting started (p. 3).

## 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.

**Choose your instance type**

**Choosing the lowest cost instance based on minimum requirements**

Minimum requirements are most useful when you know the specifications of the instances that you wan. Similarly, the 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.

**Search for an instance type by name**

If you know the instance family or instance size that you want, it's efficient to search for the instance name. For example, you can search for a `t2.medium` instance.

For information about the available Amazon EC2 instance families, see Instance type (p. 15).

**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.

**Expected utilization of EC2 instances**

Enter the expected usage of Amazon EC2 instances. The feature is only applicable when you select the On-Demand pricing strategy.

## Pricing strategy

These settings determine the pricing strategy that AWS Pricing Calculator uses to generate your estimate.

**Pricing model**

The pricing model determines whether you're searching for a pay-as-you-use instance or an instance that you can reserve in advance. Reserving an instance isn't the same as paying for the use of an instance.

**Reservation terms**

When you reserve a Reserved Instance (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 costly 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. This gives you a smaller upfront cost but accrues monthly costs. You can also pay with no upfront payment. This 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.

## Adding an Amazon EBS estimate

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. You can use it to do things such as backing up your instance, creating a boot volume, or running a database on your instance. For more information about 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. For example, you can choose better I/O and faster calculations, or slower, less expensive options for your specific use cases such as boot volumes and backups.

**Storage amount**

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

The default value is `30 GB`. You can enter `0 GB` if you don't attach Amazon EBS volumes to your Amazon EC2 instance. You can also estimate additional Amazon EBS volumes by configuring and adding a standalone Amazon EBS calculator into your estimate at https://calculator.aws/#/createCalculator/EBS .

# Advanced estimates

The advanced estimate path provides an accurate estimate. It also provides you with more parameter flexibility when generating an estimate and the ability to fine-tune your estimate. Using the advanced estimate path requires more in-depth knowledge of your Amazon EC2 needs and requirements than an estimate that's generated using the quick estimate path.

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

The advanced estimate path has the following sections and parameters:

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## Operating system

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

## 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. It does this by covering your usage with the the most appropriate combination of RIs and On-Demand Instances for you. You can define more than one workload for your estimate.

**Constant usage**

This workload is suitable for use cases that have a constant, predicable load. This includes use cases such as logging traffic to a website or running processes in the background.

**Daily spike**

This workload is best for usage patterns that peak once a day. This is suitable for scenarios where, for example, you need to run several jobs at midnight or have a morning news spike.

**Weekly spike**

This workload is best for patterns that peak once a week. This is suitable for scenarios such as blogs that post once a week and weekly television shows.

**Monthly spike**

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

## Instance type

AWS Pricing Calculator lists all available instance types. Use the search bar to filter the instances.

For more information about the available instance types, see Amazon EC2 Instance Types.

## Pricing strategy

The AWS Pricing Calculator advanced estimate path offers six pricing models for Amazon EC2 instances. The pricing models include **Cost optimized**, **On-Demand**, and **Reserved**. Cost optimized combines On-Demand Instances and RIs for the least expensive option. It also supports EC2 Instance Savings Plans, Compute Savings Plans, and Spot. For Spot, the calculator shows historical average discount percentage for the instance chosen, and lets you enter a percentage discount for creating estimates.

## Adding Amazon EBS estimates

You can add estimates for storage attached to your instance or for snapshots taken of your instance. By attaching storage to your instance, you can run databases, store logs, or create boot volumes. Snapshots

create backups of the data on your instance. You can add estimates for regular snapshots to your main estimate. The total cost for a snapshot is the sum of the initial and incremental snapshots. When AWS Pricing Calculator calculates prices, it assumes that you will use AWS Step Functions and Amazon CloudWatch to create an automated monthly retention period for your snapshots. This has the result that your snapshots are replaced monthly.

Snapshots are saved at a specific frequency, such as a monthly, weekly, daily, or hourly interval. As a result, the retention period of each incremental snapshot for a month decreases as the month progresses. AWS Pricing Calculator estimates the cost of the services that you select on a monthly basis.

## Adding data transfer estimates

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.

# 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 the workload calculator 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. This is 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. 25).
   - For information about how to choose your machine specifications, see Configuring machine specifications (p. 25).
   - For information about how to choose your pricing strategy, see Pricing strategy (p. 27).
   - For information about how to choose your cost details, see Cost details (p. 27).
5. Choose **Add to my estimate**.

For a step-by step example shows 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. 17).

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# 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's suitable for 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 descriptio | 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 the AWS Region that you choose. All AWS resources are priced based on the Region you choose.

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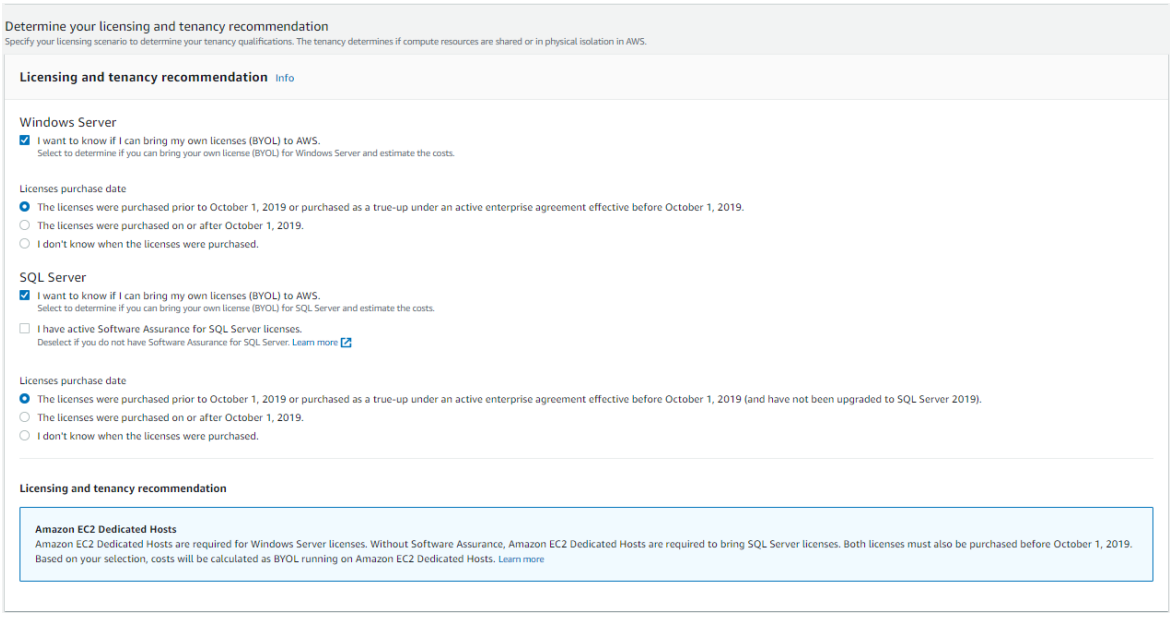
# Step 1: Choose your licensing and tenancy recommendation

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. It also 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. 25).

Some variables include the following:

- 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 Licence Included (LI) scenario that doesn't utilize the existing licenses for cost savings.




### Example Example

This example uses the following options:

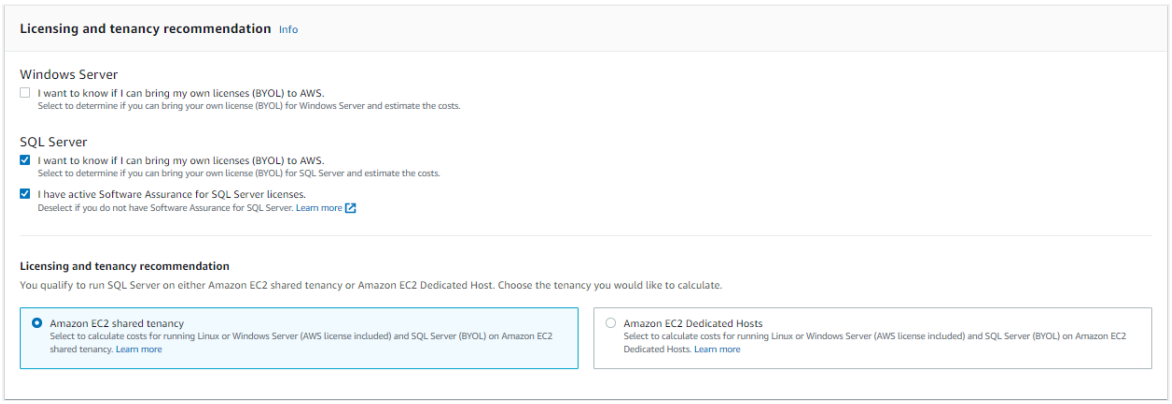
- Microsoft Windows Server License Included
- Microsoft SQL Server BYOL

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

**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.




# Step 2: Configure your machine specifications

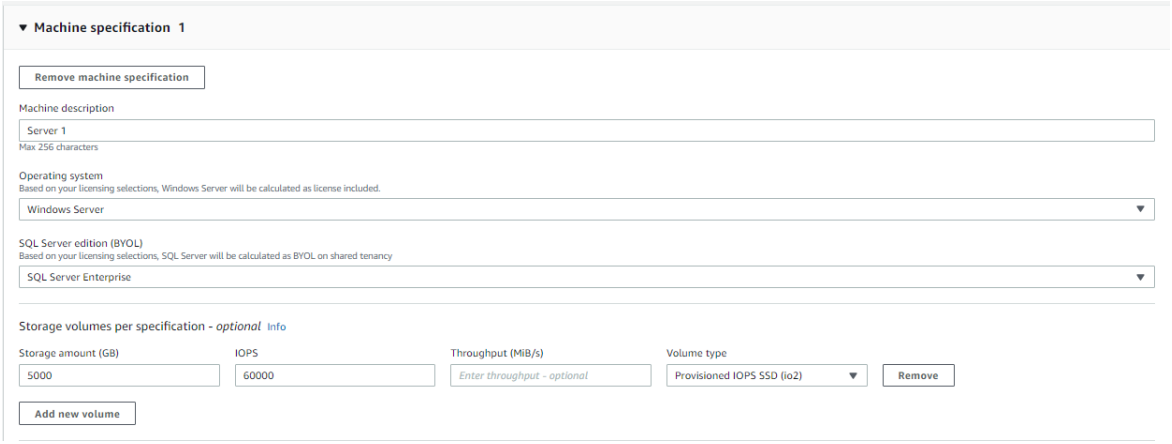
In this step, you provide machine specifications from the Example scenario table (p. 17) to configure your specifications in AWS Pricing Calculator. You enter the machine specs under **Configure machine specifications**.

**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. 19).
5. For **Amazon EC2 instance type**, choose the AWS instance recommendation. For more information, see Amazon EC2 instance type details (p. 20).
6. For **Optimize vCPU**, keep the optimize CPU value as `16`. For more information, see Benefits of Optimize vCPUs (p. 21).
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. 17).

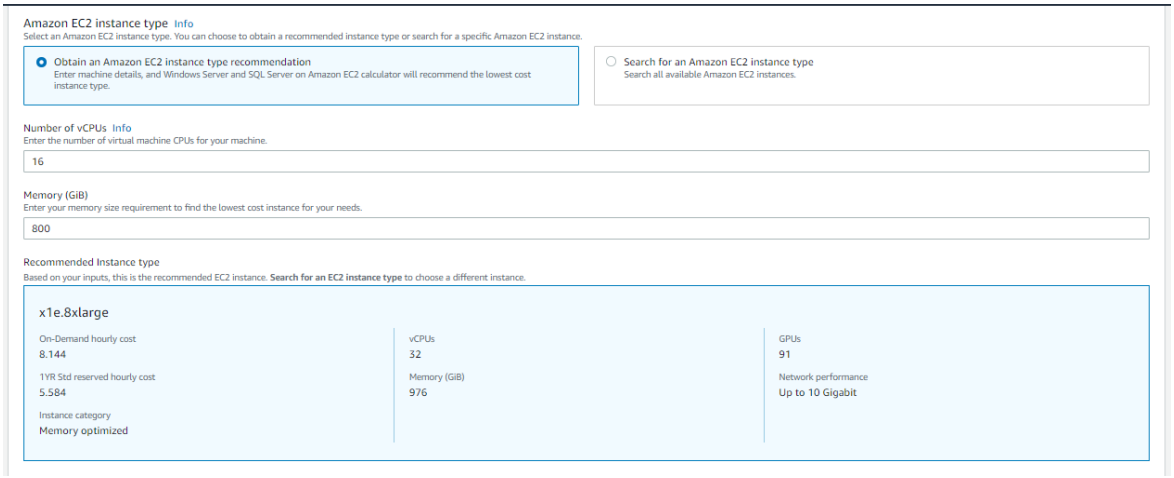
## Machine specifications details

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. 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.

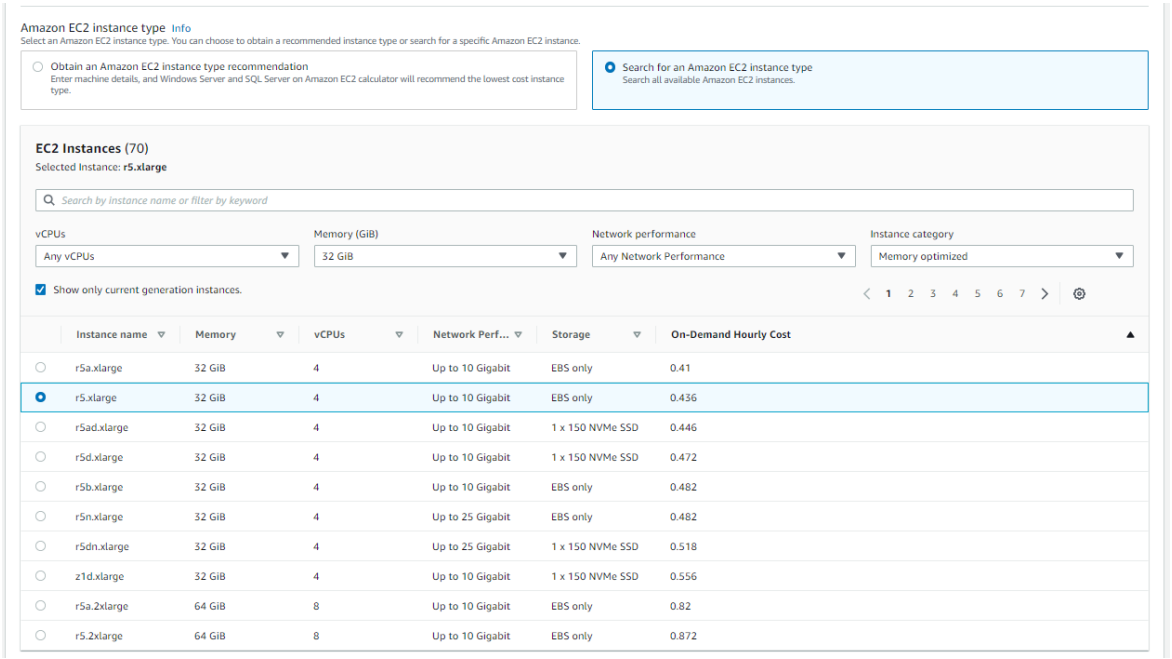



## Amazon EC2 instance type details

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.




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.




## 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.

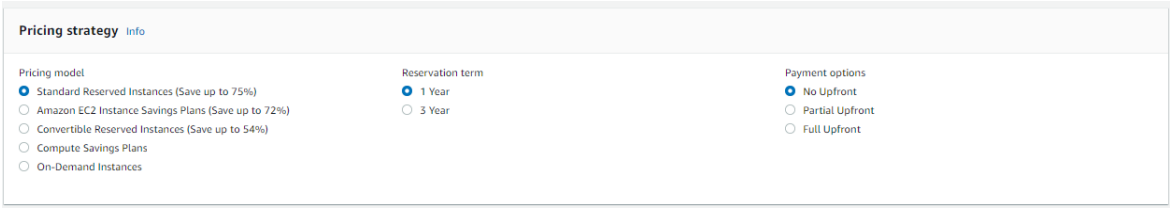
Even though the CPU optimized instance has the same price as the instance that's not optimized for CPU, it offers flexibility to choose the CPU count, so you can bring the right SQL Server license to avoid extra costs. For example, an `x1e.8xlarge` instance has 32 vCPUs by default. But you can specify `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 doesn't 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**.

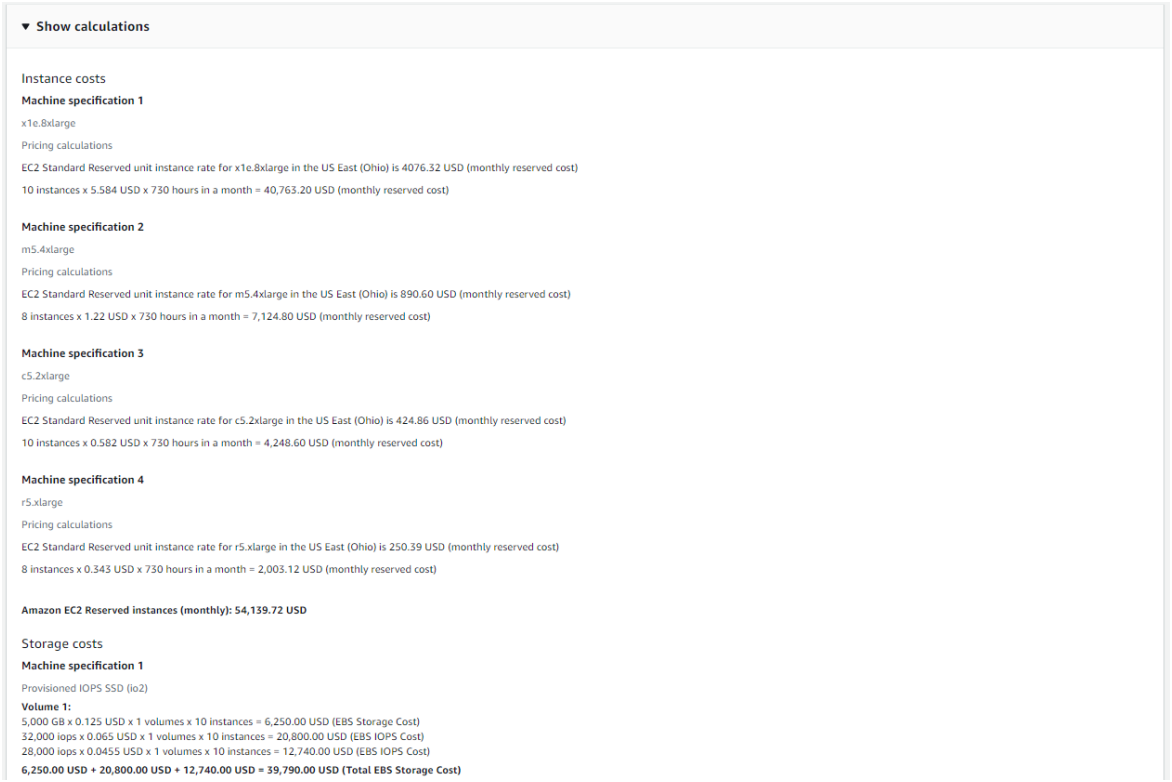



This is a default pricing strategy that offers up to 75 percent savings over On-Demand pricing. For more information, see Amazon EC2 pricing.

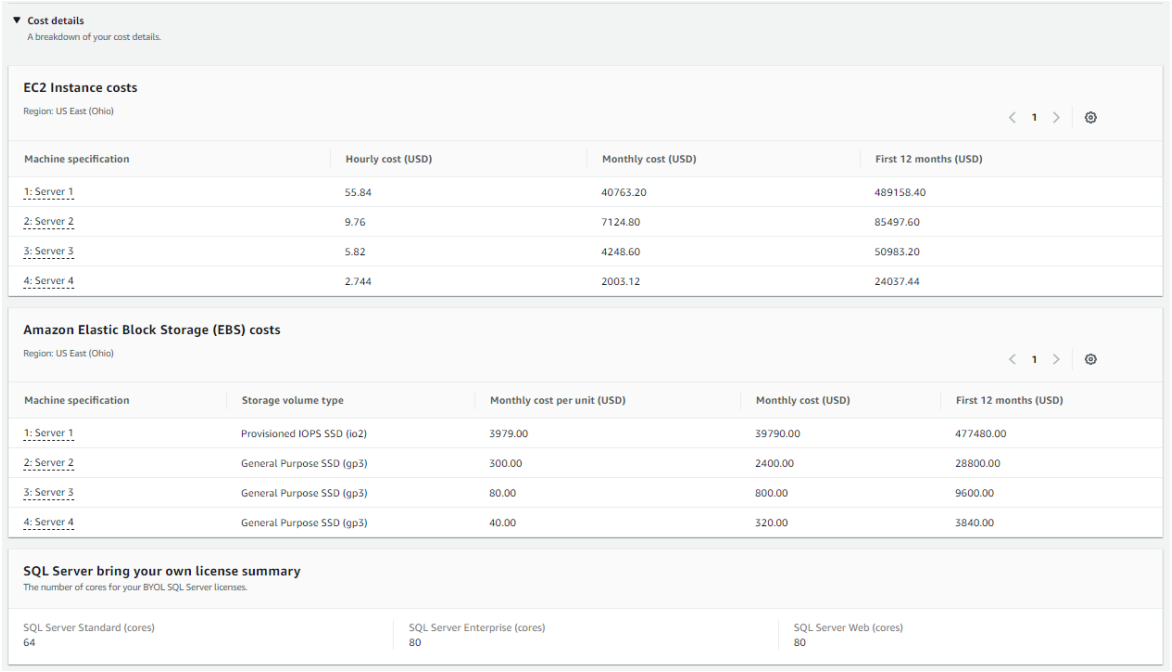
# Step 4: Show calculation and cost details

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.




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



Cost details

A breakdown of your cost details.

**EC2 Instance costs**

Region: US East (Ohio)

| 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)

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

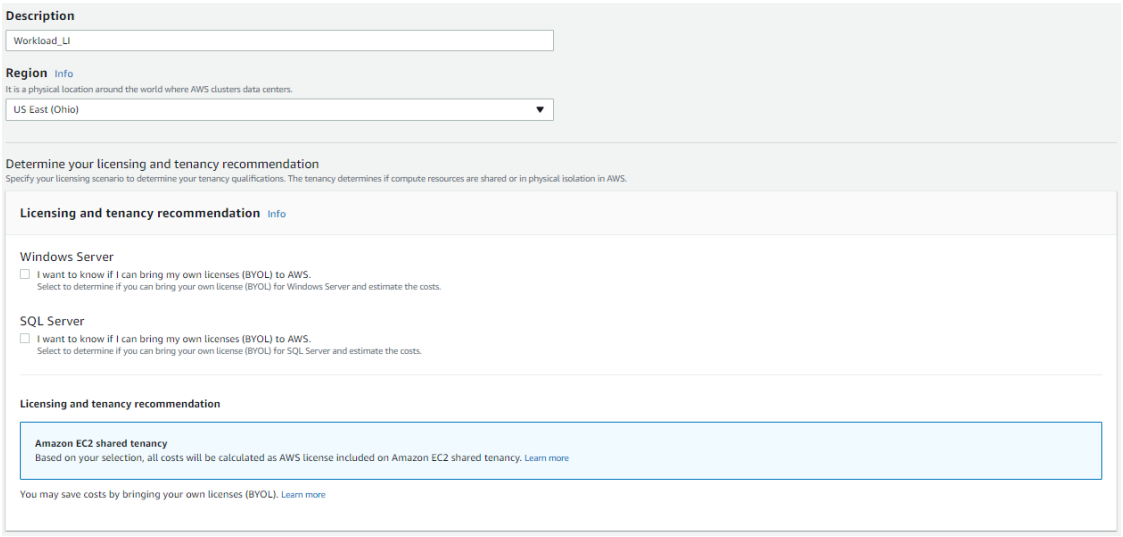
## Step 5: View and add a Windows Server and SQL Server on Amazon EC2 estimate

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 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.

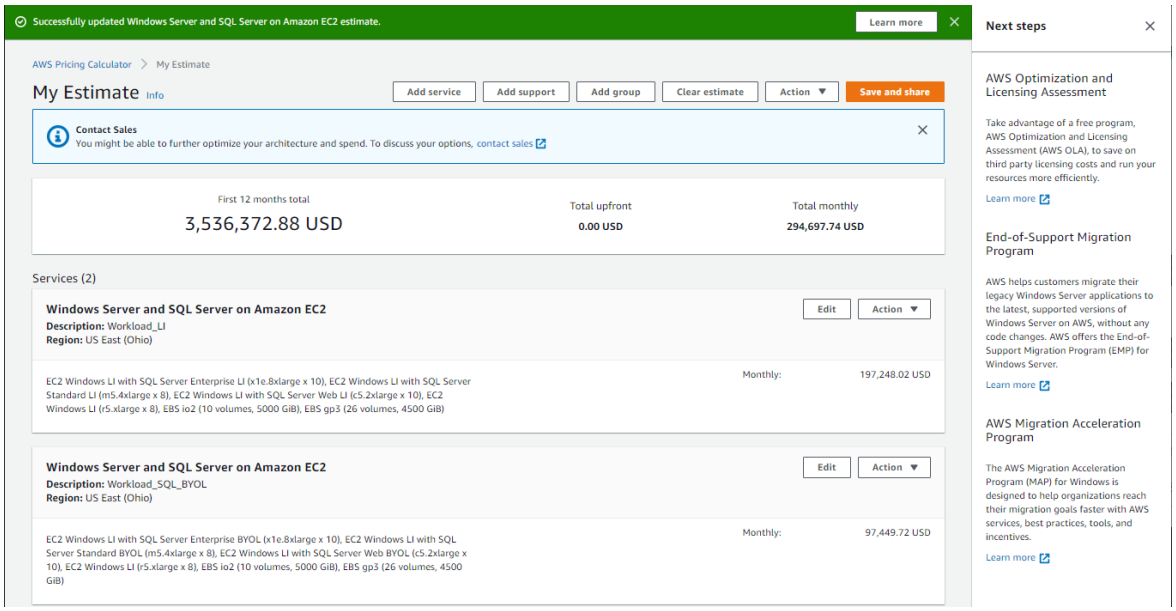
1. In the **Services** section, choose **Action**, and then choose **Clone service**.
2. Choose **Edit** on the cloned estimate.
3. For the description, enter **`Workload_LI`**.
4. Keep the **Region** as is.
5. In the **Licensing and tenancy recommendation** section, keep the **Windows Server** and **SQL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




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 Amazon Web Services. For more information, choose **Learn more**.




You 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` or `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 either none or one 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,. It 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 such as *instance category*. We recommend memory-optimized instances for database workload. You can search for them faster by 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 vCPU, by default. However, you can specify x1e.4xlarge with 4, 5, 6, 7, 8, 9,10, 12,14 Optimized vCPUs. This means BYOL customers can optimize vCPU-based licensing costs. The CPU optimized instance has the same price as the instance that iisn't optimized for CPU.

**Quantity**

The default value is 1. This is the minimum number required.

**SQL passive node**

A passive SQL Server node is one that's not serving SQL Server data to clients or running active SQL Server workloads. If you select this check box and you bring SQL Server 2014 and later versions to AWS with Software Assurance, you aren't 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're 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`. This is because it's the most common Amazon EC2 purchase, and it 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. This is 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**. 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.

# 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 unless the estimation is saved and shared with your initiative. AWS does not associate your input with an AWS account.

**Topics**



# 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 you can use to help understand the service.

- **AWS Pricing Calculator Frequently Asked Questions** – Explore the FAQs that are listed in the AWS Marketing pages
- **AWS Pricing Calculator pricing assumptions –** Understand the disclaimers for AWS Pricing Calculator prices.
- **AWS IQ –** Connect with AWS certified experts on AWS IQ to get help with your estimations.
- **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 where you can create and manage your AWS Support cases. It 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 that concern 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

| Change | Description | Date |
| --- | --- | --- |
| New save and share feature (p. 31) | Added the Saving and Sharing Your Estimate section. | December 16, 2019 |
| UI update (p. 31) | Updated the UI to enable nested groups. | December 17, 2018 |
| Initial launch (p. 31) | First publication of the documentation. | October 23, 2018 |

# AWS glossary

For the latest AWS terminology, see the AWS glossary in the *AWS General Reference*.