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What is AWS Billing and Cost Management?

AWS Billing and Cost Management is the service that you use to pay your AWS bill, monitor your usage, and analyze and control your costs.

AWS automatically charges the credit card that you provided when you signed up for a new account with AWS. Charges appear on your monthly credit card bill. You can view or update your credit card information, including designating a different credit card for AWS to charge, on the Payment Methods page in the Billing and Cost Management console. AWS Billing and Cost Management provides useful tools to help you gather information related to your cost and usage, analyze your cost drivers and usage trends, and take action to budget your spending.

Topics
- Are you a first-time billing user? (p. 1)
- Features in Billing and Cost Management (p. 1)
- Related services (p. 2)

Are you a first-time billing user?

If you're new to AWS, we recommend that you review Getting Started with AWS. This guide has useful general information about using AWS and managing your account.

If you're new to the AWS Billing and Cost Management service, we recommend that you read the following:

1. Getting started (p. 6) - Shows you how to use the Billing and Cost Management console. It also shows the feature options that you can use to monitor your AWS usage.
2. Using the AWS Free Tier (p. 22) - Describes how you can use the AWS Free Tier for your first 12 months after signing up.
3. Managing Your Payments (p. 29) - Shows you how to set up your payment methods on your AWS account.
5. Getting help (p. 4) - Shows you how to get help for your tools and find answers to questions about your bill. It includes the steps you can take to contact AWS Support about your AWS charges.

Features in Billing and Cost Management

The Billing and Cost Management service provides features that you can use to do the following:

- Estimate and plan your AWS costs
- Receive alerts if your costs exceed a threshold that you set
- Assess your biggest investments in AWS resources
- Simplify your accounting if you work with multiple AWS accounts
Analyzing Costs with Cost Explorer

The AWS Billing and Cost Management console includes the no-cost Cost Explorer (p. 57) tool for viewing your AWS cost data as a graph. With Cost Explorer, you can filter graphs by values such as API operation, Availability Zone, AWS service, custom cost allocation tag, Amazon EC2 instance type, purchase option, AWS Region, usage type, usage type group, and more. If you use consolidated billing, you can also filter by member account. In addition, you can see a forecast of future costs based on your historical cost data.

AWS Budgets

You can use AWS Budgets to track your AWS usage and costs. Budgets use the cost visualization provided by Cost Explorer to show you the status of your budgets. This provides forecasts of your estimated costs and tracks your AWS usage, including your free tier usage. You can also use budgets to create Amazon Simple Notification Service (Amazon SNS) notifications that tell you when you go over your budgeted amounts, or when your estimated costs exceed your budgets.

For more information about budgets, see Managing your costs with AWS Budgets (p. 95).

You can choose to have AWS publish billing reports to an Amazon Simple Storage Service (Amazon S3) bucket that you own. You can receive reports that break down your costs by the hour or month, by product or product resource, or by tags that you define yourself.

For more details about , see the User Guide.

Manage Your payments

You can view your estimated bills and pay your AWS invoices in your preferred currency by setting a payment currency.

AWS converts your bill to your preferred currency after your bill is finalized. Until then, all of the preferred currency amounts shown in the console are estimated in USD. AWS guarantees your exchange rate, so that refunds use the same exchange rate as your original transaction.

Note

- AWS Marketplace invoices are not eligible for this service and are processed in USD.
- This service is available only if your default payment method is Visa or MasterCard.
- The rates change daily. The rate applied to your invoice is the current rate when your invoice is created. You can check the current rate on the Billing and Cost Management console.
- You can switch back to USD.
- Currency conversion is provided by Amazon Services LLC.

For more details about your payment methods, see Managing Your Payments (p. 29).

Related services

IAM

The Billing and Cost Management service is tightly integrated with AWS Identity and Access Management (IAM). You can use IAM with Billing and Cost Management to ensure that other people who work in your account have only as much access as they need to get their job done.

You also use IAM to control access to all of your AWS resources, not just your billing information. It's important that you familiarize yourself with the basic concepts and best practices of IAM before you get too far along with setting up the structure of your AWS account.
For details about how to work with IAM and why it's important to do so, see IAM Concepts and IAM Best Practices in the IAM User Guide.

AWS Organizations (Consolidated Billing)

AWS products and services are designed to accommodate every size of company, from small start-ups to enterprises. If your company is large or likely to grow, you might want to set up multiple AWS accounts that reflect your company's structure. For example, you can have one account for the entire company and accounts for each employee, or an account for the entire company with IAM users for each employee. You can have an account for the entire company, accounts for each department or team within the company, and accounts for each employee.

If you create multiple accounts, you can use the Consolidated Billing feature of AWS Organizations to combine all member accounts under a management account, and receive a single bill. For more information, see Consolidated billing for AWS Organizations (p. 155).
Getting help with AWS Billing and Cost Management

There are many resources available for you if you have any questions about your AWS Billing and Cost Management console tools, your charges, or payment methods.

Topics
- AWS Knowledge Center (p. 4)
- Contacting AWS Support (p. 4)
- Understanding your charged usage (p. 5)
- Monitoring your Free Tier usage (p. 5)

AWS Knowledge Center

All AWS account owners have access to account and billing support free of charge. You can find answers to your questions quickly by visiting the AWS Knowledge Center.

To find your question or request
2. Choose Billing Management.
3. Scan the list of topics to locate a question that is similar to yours.

Contacting AWS Support

Contacting AWS Support is the fastest and most direct method for communicating with an AWS associate about your questions. AWS Support does not publish a direct phone number for reaching a support representative. You can use the following process to have an associate reach out to you by email or phone instead.

Only personalized technical support requires a support plan. For more information, visit AWS Support.

To open an AWS Support case where you specify Regarding: Account and Billing Support, you must either be signed into AWS as the root account owner, or have IAM permissions to open a support case. For more information, see Accessing AWS Support in the AWS Support User Guide.

If you have closed your AWS account, you can still sign in to AWS Support and view past bills.

To contact AWS Support
1. Sign in and navigate to the AWS Support Center. If prompted, enter the email address and password for your account.
2. Choose Create case.
3. On the Create case page, choose Account and billing support and fill in the required fields on the form.
4. After you complete the form, under Contact options, choose either Web for an email response, or Phone to request a telephone call from an AWS Support representative. Instant messaging support is not available for billing inquiries.

To contact AWS Support when you can't sign in to AWS

1. Recover your password or submit a form at https://support.aws.amazon.com/#/contacts/aws-account-support.
2. Choose an inquiry type in the Request information section.
3. Fill out the How can we help you? section.
4. Choose Submit.

Understanding your charged usage

If you want to see the usage behind your charged amount, you can check your usage yourself by enabling Cost Explorer. This tool enables you to analyze your costs in depth by providing you with premade reports and graphs.

Cost Explorer is available 24 hours after you activate the feature.

For more information about Cost Explorer, see Analyzing your costs with Cost Explorer (p. 57).

Monitoring your Free Tier usage

You can track your AWS Free Tier usage to keep you under the Free Tier limits. You can set up alerts on your AWS account when your Free Tier limits reach a threshold, and monitor your usage through the Billing and Cost Management console.

For more information about using these features, see Tracking your AWS Free Tier usage (p. 24).

To see details for usage that was charged beyond your Free Tier limit, see the Understanding your charged usage (p. 5) section.
Getting started

The following steps discuss a few of the most common tasks that you’re likely to perform when using the Billing and Cost Management console.

Topics
- Step 1: Review your usage (p. 6)
- Step 2: Turn on reports (p. 6)
- Step 3: Download or print your bill (p. 7)
- Step 4: Set up budgets to monitor your account (p. 7)
- Step 5: Get answers to questions about your bill (p. 9)
- Where do I go from here? (p. 9)

Step 1: Review your usage

Billing and Cost Management offers you a number of different ways to view and monitor your AWS usage. Here’s how to quickly check to see what you have used so far in the current month.

To open the Billing and Cost Management console and review your usage and charges

1. Sign in to the AWS Management Console and open the Billing and Cost Management console at https://console.aws.amazon.com/billing/. The console opens to the Dashboard, where you can see your current month-to-date usage graphs.
2. On the navigation pane, choose the applicable option:
   - **Cost Explorer**
     - Choose Cost Explorer to track and analyze your AWS usage. Cost Explorer is free for all accounts. For more information about Cost Explorer, see Analyzing your costs with Cost Explorer (p. 57).
   - **Budgets**
     - Choose Budgets to manage budgets for your account. For more information about budgets, see Monitoring your usage and costs (p. 56).
     - You can also check the status of your free tier with the provided AWS Free Tier usage alerts using AWS Budgets. For more information about AWS Free Tier usage alerts, see AWS Free Tier usage alerts using AWS Budgets (p. 24).
   - **Bills**
     - Choose Bills to see details about your current charges.
   - **Orders and Invoices**
     - Choose Orders and invoices to see your past payment transactions.

Step 2: Turn on reports

In addition to the features described in step 1, AWS Billing and Cost Management offers a set of billing reports about your AWS usage. The reports show you which AWS services you used, the amount of time
that you used them, the amount of data that you transferred in and out of storage, the average storage space that you used, and more.

To learn more about how to set up your reports, see Creating Cost and Usage Reports in the Cost and Usage Report Guide.

Step 3: Download or print your bill

AWS Billing and Cost Management closes the billing period at midnight on the last day of each month and then calculates your bill. Most bills are ready for you to download by the seventh accounting day of the month.

To download your bill
2. On the navigation pane, choose Bills.
3. For Date, choose the month of the bill you want to work with.
4. Choose Download CSV to download a comma-separated variable file or choose Print.

Step 4: Set up budgets to monitor your account

If you use the AWS Free Tier, Billing and Cost Management automatically provides AWS Free Tier usage alerts via AWS Budgets to track your free tier usage. Billing and Cost Management notifies you when you go over the free tier limits or are forecasted to go over the free tier limits. AWS sends these notifications to the email that you used to create your AWS account.

In addition to the free tier usage alerts, you can use budgets to notify you when your monthly charges for using an AWS product exceed or are forecasted to exceed a threshold that you set.

By default, IAM users don't have access to billing information, and therefore don't have access to budgets. If you're logged in to AWS as an IAM user, verify that the account owner has granted IAM users access to AWS Budgets. For more information about IAM restrictions,

To create a budget

Use this procedure to create a cost-based budget.
2. In the navigation pane, choose Budgets.
3. At the top of the page, choose Create budget.
4. For Select budget type, choose Cost budget.
5. Choose Set up your budget.
6. For Name, enter the name of your budget. Your budget name must be unique within your account and can use A-Z, a-z, spaces, and the following characters:
   __.:/*+-%@

7. For Period, choose how often you want the budget to reset the actual and forecasted spend. Choose Monthly for every month, Quarterly for every three months, and Annually for every year.
8. For Budgeted Amount, enter the total amount that you want to spend for this budget period.
9. (Optional) For **Budget effective dates**, choose **Recurring Budget** for a budget that resets after the budget period or **Expiring Budget** for a one-time budget that doesn't reset after the budget period.

For **Start Month**, choose the month that you want the budget to start on.

For an **Expiring Budget**, for **End Month**, choose the month that you want the budget to end on.

All budget times are in UTC.

10. (Optional) Under **Budget parameters (optional)**, for **Filtering**, choose one or more of the available filters (p. 106). Your choice of budget type determines the set of filters that is displayed on the console.

11. (Optional) Under **Budget parameters (optional)**, for **Advanced options**, choose one or more of the following filters. If you're signed in from a member account in an organization instead of from a management account, you might not see all of the advanced options.

   **Refunds**
   - Any refunds that you received.

   **Credits**
   - Any AWS credits that are applied to your account.

   **Upfront reservation fees**
   - Any upfront fees that are charged to your account. When you purchase an All Upfront or Partial Upfront Reserved Instance from AWS, you pay an upfront fee in exchange for a lower rate for using the instance.

   **Recurring reservation charges**
   - Any recurring charges to your account. When you purchase a Partial Upfront or No Upfront Reserved Instance from AWS, you pay a recurring charge in exchange for a lower rate for using the instance.

   **Taxes**
   - Any taxes that are associated with the charges or fees in your budget.

   **Support charges**
   - Any charges that AWS charges you for a support plan. When you purchase a support plan from AWS, you pay a monthly charge in exchange for service support.

   **Other subscription costs**

   **Use blended costs**
   - The cost of the instance hours that you used. A blended rate doesn't include either the RI upfront costs or the RI discounted hourly rate.

   **Use amortized costs**
   - The amortized cost of any reservation hours that you used. For more information about amortized costs, see [Show amortized costs](#).

12. Choose **Configure alerts**.

13. Under **Configure alerts**, for **Alert 1**, choose **Actual** to create a notification for actual spend and **Forecast** to create a notification for your forecasted spend.

14. For **Alert threshold**, enter the amount that you want to be notified at. This can be either an absolute value or a percentage. For example, for a budget of 200 dollars, if you want to be notified at 160 dollars (80% of your budget), enter 160 for an absolute budget or 80 for a percentage budget.

   Next to the amount, choose **Absolute amount** to be notified when the threshold amount is passed and **% of budgeted amount** to be notified when the threshold percentage of the budget is passed.
15. (Optional) For **Email contacts**, enter the email addresses that you want the notifications to be sent to and choose **Add email contact**. Separate multiple email addresses with a comma. A notification can have up to 10 email addresses.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

16. (Optional) For **SNS topic ARN**, enter the ARN for your Amazon SNS topic and then choose **Verify**. If you want to use an Amazon SNS topic for your notification but don't have one, see **Create a Topic** in the *Amazon Simple Notification Service Developer Guide*.

   AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the **Verify** step fails, check the Amazon SNS topic policy to make sure that it allows your budget to publish to that topic.

   For a sample policy and instructions on granting your budget permissions, see **Creating an Amazon SNS topic for budget notifications** (p. 112). A notification can be subscribed to only one Amazon SNS topic.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

17. Choose **Confirm budget**.

18. Review your budget settings and choose **Create**.

   **Important**
   When you finish creating a budget with Amazon SNS notifications, Amazon SNS sends a confirmation email to the email addresses that you specify. The subject line is **AWS Notification - Subscription Confirmation**. A recipient must choose **Confirm subscription** in the confirmation email to begin receiving notifications.

---

**Step 5: Get answers to questions about your bill**

If you have questions about your bill, see the *AWS Knowledge Center*. If you don't find the answer that you're looking for in the Knowledge Center, you can access account and billing support free of charge. For more information about AWS Support, see **Getting help with AWS Billing and Cost Management** (p. 4). For information about closing your account, see **close your account** (p. 18).

**Where do I go from here?**

Explore some of the features designed to help you dig a little deeper and streamline your accounting practices.

- Tracking your AWS Free Tier usage (p. 24)
- *Cost and Usage Reports User Guide*
- Analyzing your costs with Cost Explorer (p. 57)
- Managing your costs with AWS Budgets (p. 95)
- Consolidated billing for AWS Organizations (p. 155)
Managing your account

Use the procedures in this chapter to manage your account settings, your default currency, your alternate contacts, and more.

Topics
- Managing an AWS account (p. 10)
- Managing an account in India (p. 14)
- Closing an account (p. 18)

Managing an AWS account

You can use the Billing and Cost Management console to change account settings, including your contact and alternate contact information, the currency that you pay your bills in, the Regions that you can create resources in, and your tax registration numbers.

Note
Some sections can only be edited by the AWS account root user. If you do not see the Edit option, switch to the root user.

Topics
- Editing Your Account name, root user password, and root user email address (p. 10)
- Editing contact information (p. 11)
- Changing which currency you use to pay your bill (p. 11)
- Adding, changing, or removing alternate contacts (p. 11)
- Enabling and disabling regions (p. 12)
- Updating and deleting tax registration numbers (p. 13)
- Enabling tax setting inheritance (p. 14)

Editing Your Account name, root user password, and root user email address

To edit your account name, root user password, or email address, perform the following procedure. Email in this case refers to the AWS account root user email address. This is the email address you use to sign in.

To edit your account name, root user password, or root user email address

2. On the navigation bar, choose your account name, and then choose My Account.
3. On the Account Settings page, next to Account Settings, choose Edit.
4. Next to the field to update, choose Edit.
5. After you have entered your changes, choose **Save changes**.
6. After you have made all of your changes, choose **Done**.

**Editing contact information**

You can change the contact information associated with your account, including your mailing address, telephone number, and website address. To edit your contact information, perform the following procedure.

**To edit your contact information**

2. On the navigation bar, choose your account name, and then choose **My Account**.
3. Under **Contact Information**, choose **Edit**.
4. For the fields to change, enter your updated information and then choose **Update**.

**Note**

You can add an email address for billing in the **Alternate Contacts** section to have AWS send a copy of billing-related emails to that email address. For example, AWS sends your **Billing contact address** a message that your monthly bill is ready.

**Changing which currency you use to pay your bill**

To change the currency that you use to pay your bill, for example, from Danish kroner to South African rand, perform the following procedure.

**To change the local currency associated with your account**

2. On the navigation bar, choose your account name, and then choose **My Account**.
3. Scroll down to the **Payment Currency Preference** section. Next to **Payment Currency Preference**, choose **Edit**.
4. For **Select Payment Currency**, select the currency to pay your bill in and then choose **Update**.

**Adding, changing, or removing alternate contacts**

Alternate contacts enable AWS to contact another person about issues with your account, even if you're unavailable. To add, change, or delete alternate contacts for your account, perform the following procedure.

**To add, update, or remove alternate contacts**

2. On the navigation bar, choose your account name, and then choose **My Account**.
3. Scroll down to the **Alternate Contacts** section and choose **Edit**.
4. For the fields to change, enter your updated information and choose **Update**.
Examples for alternate contacts

We would reach out to each contact type in the following scenarios:

- **Billing** - When your monthly invoice is available, or your payment method needs to be updated. If your **Receive PDF Invoice By Email** is turned on in your **Billing preferences**, your alternate billing contact will receive the PDF invoices as well.

- **Operations** - When your service is, or will be, temporarily unavailable in one of more Regions. Any notification related to operations.

- **Security** - When you have notifications from the AWS Abuse team for potentially fraudulent activity on your AWS account. Any notification related to security.

Enabling and disabling regions

AWS originally enabled all new Regions by default, which enabled your users to create resources in any Region. Now when AWS adds a Region, the new Region is disabled by default. If you want your users to be able to create resources in a new Region, you enable the Region.

Note the following about enabling and disabling Regions:

**You can use IAM permissions to control access to Regions**

IAM added three new permissions, which let you control which users can enable, disable, and list Regions. For more information, see Billing and Cost Management actions policies (p. 173).

**Enabling a Region is free**

There is no charge to enable a Region. You're only charged for resources that you create in the new Region.

**Disabling a Region disables access to resources in the Region**

If you disable a Region that still includes AWS resources, such as Amazon EC2 instances, you can't access the resources in that Region. For example, you can't use the AWS Management Console or any programmatic method to view or change the configuration of any EC2 instances in that Region.

**Charges continue if you disable a Region**

If you disable a Region that still includes AWS resources, charges for those resources (if any) continue to accrue at the standard rate. For example, if you disable a Region that contains Amazon EC2 instances, you still have to pay the charges for those instances even though the instances are inaccessible.

**Disabling a Region isn't always immediately visible**

If you disable a Region, the change takes time to become visible in all possible endpoints. Disabling a Region can take between a few seconds to minutes to take effect.

**Existing Regions are enabled by default**

The original Regions (the Regions that existed before we added the ability to enable and disable Regions) are all enabled by default and can't be disabled.

**Enabling a Region takes a few minutes for most accounts**

Enabling a Region generally takes effect in a few minutes, although it can take longer for some accounts. If enabling a Region takes longer than nine hours, sign in to the AWS Support Center and open a case with AWS Support.

Perform the applicable procedure:
• Enable a Region (p. 13)
• Disable a region (p. 13)

To enable a Region

2. On the navigation bar, choose your account name, and then choose My Account.
3. Under AWS Regions, next to the Region to enable, choose Enable.
   
   Older Regions are enabled by default.
4. In the dialog box, choose Enable region.

For more information about enabling a Region, including the permissions required, see Managing AWS Regions.

To disable a Region

You can disable some Regions on your My Account page.

2. On the navigation bar, choose your account name, and then choose My Account.
3. Under AWS Regions, next to the Region to disable, choose Disable.

   Not all Regions can be disabled.
4. In the dialog box, for To confirm disabling in this region, enter disable and choose Disable region.

Updating and deleting tax registration numbers

To update or delete one or more tax registration numbers, perform the applicable procedure:

• Update tax registration numbers (p. 13)
• Delete tax registration numbers (p. 13)

To update tax registration numbers

2. In the navigation pane, choose Tax Settings.
3. Under Manage Tax Registration Numbers, select the numbers to edit.
4. For Manage Tax Registration, choose Edit.
5. Update the fields to change and choose Update.

To delete tax registration numbers

You can remove one or more tax registration numbers.

2. In the navigation pane, choose Tax Settings.
3. Under Manage Tax Registration Numbers, select the tax registration numbers to delete.
4. For Manage Tax Registration, choose Delete.
5. In the Delete tax registration dialog box, choose Delete.

Enabling tax setting inheritance

You can use your tax registration information with your linked accounts by enabling your Tax Settings Inheritance. After you enable it, your tax registration information is added to your other AWS Organizations accounts, saving you the effort of registering redundant information. Tax invoices are processed with the consistent tax information, and your usage from linked accounts will consolidate to a single tax invoice.

Tax registration information includes:

- Business legal name
- Tax address
- Tax registration number
- Special exemptions (does not apply for US sales tax exemptions)

To enable tax setting inheritance

2. In the navigation pane, choose Tax Settings.
4. Choose Continue.

Managing an account in India

If you sign up for a new account and choose India for your contact address, your user agreement is with Amazon Internet Services Pvt. Ltd (AISPL), a local AWS seller in India. AISPL manages your billing, and your invoice total is listed in rupees instead of dollars. After you create an account with AISPL, you can't change the country in your contact information.

If you have an existing account with an India address, your account is either with AWS or AISPL, depending on when you opened the account. To learn whether your account is with AWS or AISPL, see the procedure Determining Which Company Your Account is With (p. 15). If you are an existing AWS customer, you can continue to use your AWS account. You also can choose to have both an AWS account and an AISPL account, though they can't be consolidated into the same payment family. For information about managing an AWS account, see Managing an AWS account (p. 10).

If your account is with AISPL, follow the procedures in this chapter to manage your account. This chapter explains how to sign up for an AISPL account, edit information about your AISPL account, and add or edit your Permanent Account Number (PAN).

As part of the credit card verification during signup, AISPL charges your credit card 2 INR. AISPL refunds the 2 INR after verification is done. You might be redirected to your bank as part of the verification process.

Topics
### Determining which company your account is with

AWS services are provided by both AWS and AISPL. Use this procedure to determine which seller your account is with.

**To determine which company your account is with**

2. In the page footer, look at the copyright notice. If the copyright is for Amazon Web Services, Inc., then your account is with AWS. If the copyright is for Amazon Internet Services Private Ltd., then your account is with AISPL.

### Signing up for AISPL

AISPL is a local seller of AWS. Use the following procedure to sign up for an AISPL account if your contact address is in India.

**To sign up for an AISPL account**

If your contact address is in India and you want to open an account, you sign up with AISPL instead of AWS.

1. Go to [https://console.aws.amazon.com/](https://console.aws.amazon.com/), and then choose **Sign In to the Console**.
2. On the **Sign In** page, type the email address that you want to use.
3. Under your email address, select **I am a new user**, and then choose **Sign in using our secure server**.
4. For each of the login credential fields, type your information, and then choose **Create account**.
5. For each of the contact information fields, type your information.
6. After you have read the customer agreement, select the terms and conditions check box, and then choose **Create Account and Continue**.
7. On the **Payment Information** page, enter the payment method that you want to use.
8. Under **PAN Information**, choose **No** if you do not have a Permanent Account Number (PAN) or want to add it later. If you have a PAN and want to add it now, choose **Yes**, and in the **PAN** field type your PAN.
9. Choose **Verify Card and Continue**. You must provide your CVV as part of the verification process. AISPL charges your card 2 INR as part of the verification process. AISPL refunds the 2 INR after verification is done.
10. For **Provide a telephone number**, type your phone number. If you have a phone extension, for **Ext**, type your phone extension.
11. Choose **Call Me Now**. After a few moments, a four-digit pin will appear on your screen.
12. Accept the automated call from AISPL. On your phone keypad, type the four-digit pin displayed on your screen.
13. Once the automated call verifies your contact number, choose **Continue to Select Your Support Plan**.
14. On the Support Plan page, select your support plan, and then choose Continue. After your payment method is verified and your account is activated, you receive an email confirming the activation of your account.

Managing your AISPL account

Use the Account Settings and Tax Settings pages of the Billing and Cost Management console to perform the following tasks:

- Edit your user name, password, or email address
- Edit your contact information
- Add, update, or remove alternate contacts
- Add or edit a Permanent Account Number (PAN)
- Edit multiple Permanent Account Numbers (PANs)
- Edit multiple Goods and Services Tax Numbers (GSTs)
- View a tax invoice

To edit your user name, password, or email address

You can change the name, password, and email address associated with your AISPL account.

2. On the navigation bar, choose your account name, and then choose My Account.
3. Next to Account Settings, choose Edit.
4. Next to the field that you want to update, choose Edit.
5. After you have entered your changes, choose Save changes.
6. After you have made your changes, choose Done.

To edit your contact information

You can change the contact information associated with your AISPL account, including your mailing address, telephone number, and website address. You cannot change your country.

2. On the navigation bar, choose your account name, and then choose My Account.
3. Under Contact Information, choose Edit.
4. For the fields that you want to change, type your updated information, and then choose Update.

Note

You can choose to add an email address for billing in the Alternate Contacts section to have AISPL send a copy of billing-related emails to that email address. For example, AISPL sends a copy of your monthly bill to your Billing contact address.

To add, update, or remove alternate contacts

You can add alternate contacts to your account. Alternate contacts enable AISPL to contact another person about issues with your account, even if you are unavailable.
2. On the navigation bar, choose your account name, and then choose My Account.
3. Scroll down to the Alternate Contacts section, and then choose Edit.
4. For the fields that you want to change, type your updated information, and then choose Update.

To add or edit a PAN

You can add your Permanent Account Number (PAN) to your account and edit it.

2. In the navigation pane, choose Tax Settings.
3. On the Tax Settings navigation bar, choose Edit.
4. For Permanent Account Number (PAN), enter your PAN, and then choose Update.

To edit multiple PAN numbers

You can edit multiple Permanent Account Numbers (PANs) in your account.

2. In the navigation pane, choose Tax Settings.
3. Under Manage Tax Registration Numbers, select the PAN numbers that you want to edit.
4. For Manage Tax Registration, choose Edit.
5. Update the fields that you want to change, and then choose Update.

To edit multiple GST numbers

You can edit multiple Goods and Services Tax numbers (GSTs) in your account.

2. On the navigation pane, choose Tax Settings.
3. Under Manage Tax Registration Numbers, select the GST numbers that you want to edit or choose Edit all.
4. For Manage Tax Registration, choose Edit.
5. Update the fields that you want to change and choose Update.

To view a tax invoice

You can view your tax invoices in the console.

2. On the navigation pane, choose Bills.
3. Under Summary, under Credits and Tax Invoices, choose Tax Invoices.
4. Choose an invoice hyperlink.

Note
The Tax Invoices is only visible if there are tax invoices available.
Closing an account

Only the AWS account root user can close an AWS account. AWS can't close accounts on your behalf. If you have any questions throughout the process, you can contact your account representative or contact AWS Support for assistance. For more information about contacting AWS Support, see Contacting AWS Support (p. 4).

Topics

• Considerations before you close your AWS account (p. 18)
• Troubleshooting errors when closing an AWS account (p. 20)
• Closing your AWS account (p. 20)
• Accessing your AWS account after closure (p. 21)
• After the post-closure period (p. 21)

Considerations before you close your AWS account

Before closing your AWS account, consider the following:

Topics

• Your agreement with AWS (p. 18)
• AWS management console access (p. 18)
• Existing content and services still in use (p. 18)
• Your payment method (p. 19)
• On-Demand charges (p. 19)
• Domains registered with Amazon Route 53 (p. 19)
• Charges if you reopen your AWS account (p. 19)
• Closing a member account (p. 20)
• Cross-account access to the account you’re closing (p. 20)
• Removing Amazon VPC peering connection (p. 20)

Your agreement with AWS

Your closure of your AWS account serves as notice to us that you want to terminate the AWS customer agreement or other agreement with AWS that governs your AWS account, solely with respect to the specific AWS account. If you reopen your AWS account during the post-closure period (that is, within 90 days after your account is closed), you agree that the same agreement terms will govern your access to and use of the service offerings through your reopened AWS account.

AWS management console access

Your access to the AWS Management Console for the closed AWS account is restricted. During the post-closure period, you can still sign in to your AWS account to view your past billing information and access AWS Support. You can't access any other AWS services or start any new AWS services in the closed account.

Existing content and services still in use

After the post-closure period, any remaining content in your AWS account is deleted, and services that are still in use are terminated. Before closing your account, you should retrieve all content from the
account. For instructions on how to retrieve your content, see the documentation for that service. For more information about the post-closure period, see Accessing your AWS account after closure (p. 21).

Your payment method

We charge you through your designated payment method for any usage fees incurred before you closed your AWS account. We might issue you any refunds that are due through that same payment method. If you have active subscriptions (such as a Reserved Instance that you pay for monthly), even after your account is closed, you might continue to be charged for the subscription through your designated payment method until the subscription expires or is sold according to the terms governing the subscription. These charges and refunds might occur after you close your account.

In addition, if you reopen your account, you might be charged for the cost of running AWS services (that you didn't terminate before closing your account) during the post-closure period. Closing your AWS account doesn't affect payment methods that you use on Amazon.com or other Amazon websites.

On-Demand charges

During the post-closure period, billing for On-Demand charges stops. However, you’re billed for any usage that has accrued up until the time you closed your account. You’ll be charged for that usage at the beginning of the next month. In addition, if you purchased any subscriptions with ongoing payment obligations, you might continue to be charged for them after your account is closed.

Important
You will continue to generate costs if you don’t terminate your resources.

Domains registered with Amazon Route 53

Domains that are registered with Route 53 are not deleted automatically. When you’re closing your AWS account, you have three options:

- You can disable automatic renewal, and the domains are deleted when the registration period expires.
  For more information, see Enabling or Disabling Automatic Renewal for a Domain in the Amazon Route 53 Developer Guide.
- You can transfer the domains to another AWS account. For more information, see Transferring a Domain to a Different AWS Account.
- You can transfer the domains to another domain registrar. For more information, see Transferring a Domain from Route 53 to Another Registrar.

If you already closed the account, you can open a case with AWS Support to get help with disabling automatic renewal or transferring your domains. For more information, see Contacting AWS Support About Domain Registration Issues. There is no charge to open a case for domain registration issues.

Charges if you reopen your AWS account

If you reopen your AWS account during the post-closure period, you might be billed for the cost of any AWS services that are not terminated before you closed your account.

Example

You reopen your AWS account 30 days after closure, and your AWS account had only an active t-example.example Amazon EC2 instance at closure. The price for a t-example.example Amazon EC2 instance in your AWS Region is $0.01 per hour. In this case, you might be charged for 30 days x 24 hours x $0.01 per hour = $7.20 for your AWS services.
Closing a member account

When you close an account that was created with AWS Organizations, that account is not removed from the organization until after the post-closure period. During the post-closure period, a closed member account still counts toward your limit of accounts in the organization.

To avoid having the account count against the limit, remove member accounts from the organization before closing it. For more information, see Closing an AWS Account in the AWS Organizations User Guide.

Cross-account access to the account you're closing

After you close your AWS account, any access requests to your closed account's AWS services from other AWS accounts fail. This occurs even if you have granted the other accounts permission to access your account's AWS services. If you reopen your AWS account, other AWS accounts can access your account's AWS services if you have granted the other accounts the necessary permissions.

Removing Amazon VPC peering connection

AWS currently does not delete Amazon VPC peering connections when you close one of the accounts participating in the VPC peering connection. Any traffic destined for the VPC peering connection originating from other active accounts is dropped because AWS terminates instances and deletes any security groups in the closed account. To remove the VPC peering connection, you can delete it from your account using the Amazon VPC console, AWS CLI, or Amazon EC2 API.

Troubleshooting errors when closing an AWS account

If you receive an error message while trying to close your AWS account, you can contact your account representative or contact us to open a billing or account support case for assistance. Common reasons why you might not be able to close your AWS account include the following:

- Your account is the management account of an organization in AWS Organizations with open member accounts.
- You have unpaid invoices for your account.
- You have not signed in to the account as the root user.
- You are an active AWS Marketplace seller.

Closing your AWS account

You can close your AWS account using the following procedure.

To close your AWS account

1. Sign in as the root user of the account that you want to close, using the email address and password that are associated with the account. If you sign in as an AWS Identity and Access Management (IAM) user or role, you can't close an account.
3. On the navigation bar in the upper-right corner, choose your account name (or alias), and then choose My Account.
4. On the Account Settings page, scroll to the end of the page to the Close Account section. Read and ensure that you understand the text next to the check box. After you close an AWS account, you can no longer use it to access AWS services.
5. Select the check box to accept the terms, and then choose **Close Account**.

6. In the confirmation box, choose **Close Account**.

**Accessing your AWS account after closure**

After you close an AWS account in accordance with the process above, you can no longer use it to access AWS services, but for 90 days after your account is closed (the "Post-Closure Period"), you can view your AWS account's past billing information and access **AWS Support**.

During the Post-Closure Period, AWS may retain any content that you didn't delete and any AWS services that you didn't terminate before you closed your AWS account. You can access any remaining content or AWS services only by reopening your account during the Post-Closure Period. You can reopen your AWS account by contacting **AWS Support**. If you choose to reopen your account, you can access the content that you didn't delete and AWS services that you didn't terminate before closing your account, but you might be charged for the cost of running those AWS services during the Post-Closure Period. You can estimate the cost of running AWS services using the **AWS Pricing Calculator** in the **AWS Pricing Calculator User Guide**.

**After the post-closure period**

After the Post-Closure Period, we permanently close your AWS account, and you can't reopen it. Any content that you didn't delete is deleted, and any AWS services that you didn't terminate are terminated. Service attributes can be retained as long as needed for billing and administration purposes. You also can't create a new AWS account using the same alias or email address that was registered to your AWS account at the time of its closure.
Using the AWS Free Tier

You can try some AWS services free of charge within certain usage limits. AWS calls this the AWS Free Tier. The AWS Free Tier is designed to give you hands-on experience with a range of AWS services at no charge. For example, you can explore AWS as a platform for your business by setting up a test website with a server, alarms, and database. You can also try out services for developers, such as AWS CodePipeline, AWS Data Pipeline, and AWS Device Farm.

When you create an AWS account, you're automatically signed up for the AWS Free Tier for 12 months. Your AWS Free Tier eligibility expires at the end of the 12-month period. When your Free Tier expires, AWS starts charging the regular rates for any AWS services and resources that you're using.

To avoid charges while on the AWS Free Tier, you must keep your usage below the AWS Free Tier limits. You are charged for any usage that exceeds the limits. To help you stay within the limits, you can track your AWS Free Tier usage and set a billing alarm to notify you if you start incurring charges. For more information, see AWS Free Tier limits (p. 23) and Tracking your AWS Free Tier usage (p. 24). For tips about avoiding unexpected charges, see Avoiding unexpected charges (p. 151). Contact AWS Support if you require additional explanation of unexpected charges on your bill.

If you don't use the full benefits provided by the AWS Free Tier in a given month, the benefits don't roll over to the next month. To maximize your AWS Free Tier benefits, be sure to spend time with AWS each month, trying out the services that you're curious about.

For more information about which services offer a AWS Free Tier, see AWS Free Tier.

Topics
- Eligibility for the AWS Free Tier (p. 22)
- AWS Free Tier limits (p. 23)
- Tracking your AWS Free Tier usage (p. 24)

Eligibility for the AWS Free Tier

You receive the benefits of the AWS Free Tier automatically for 12 months after you sign up for an AWS account. If you exceed the usage limits of the AWS Free Tier, use a service that doesn't provide AWS Free Tier benefits, or continue to use AWS after you're no longer eligible for the AWS Free Tier, you're charged at the standard billing rates for your AWS usage. For a list of services that offer AWS Free Tier benefits, see AWS Free Tier.

If you have an existing AWS account but you're not sure if it's still eligible for the AWS Free Tier, open the Billing and Cost Management console. If your account is eligible for the AWS Free Tier, you see a message in the Alerts & Notifications section, as shown in the following screenshot.

![Alerts & Notifications](image)

You can also choose Bills in the navigation pane of the console to see when you created your AWS account. In the Date drop-down box, you will find one bill for each month since you opened your account even if you didn't have charges.

If your company creates your AWS account through AWS Organizations, AWS Free Tier eligibility for all member accounts begins on the day that the management account of the organization is created. For more information, see the AWS Organizations User Guide.
When your AWS Free Tier eligibility is coming to an end, AWS sends a notification to the email address that you used when you signed up for AWS. If you decide to continue using AWS after your AWS Free Tier eligibility ends, be sure to clean up any resources that you no longer need to avoid being charged for their use. If you decide not to continue using AWS, you can close your account.

**AWS Free Tier limits**

All services that offer a AWS Free Tier have limits on what you can use without being charged. Many services have multiple types of limits. For example, Amazon EC2 has limits on both the type of instance you can use and how many hours you can use in one month. Amazon S3 has a limit on how much storage you can use and on how often you can call certain operations each month. For example, the AWS Free Tier covers the first 20,000 times you retrieve a file from Amazon S3, but you're charged for additional file retrievals. Each service has limits that are unique to that service.

Some of the most common limits are by time, such as hourly or by the minute, or by requests, which are the requests you send to the service, also known as API operations. For more information about AWS Free Tier limits, see AWS Free Tier.

**Topics**

- Hourly usage in the AWS Free Tier (p. 23)
- Amazon Machine Images (p. 24)

**Hourly usage in the AWS Free Tier**

Some services, such as Amazon EC2, Amazon RDS, and Elastic Load Balancing, charge for usage on an hourly basis. The AWS Free Tier for these services provides you with a monthly allotment of hours for the first 12 months. For example, the AWS Free Tier for Amazon EC2 provides you with 750 hours usage of Linux (any combination of t1.micro, t2.micro, and t3.micro instances), plus 750 hours usage of Windows (any combination of t1.micro, t2.micro, and t3.micro instances). How you divide this allotment is up to you. In this example, you can run 750 hours of a Linux t2.micro, or t1.micro instance with 750 hours of a Windows t2.micro, or t1.micro instance each month for the first 12 months. In Regions where t2.micro is not available, the t3.micro equivalent is supported under AWS Free Tier. For example, you can use one Linux instance continuously for a month, or 10 Linux instances for 75 hours a month.

In some cases, leaving your resources running maximizes your AWS Free Tier benefits. For example, when an Amazon EC2 instance enters into running state, a full instance hour is charged. This will occur every time an instance changes into running state, even in the same hour. Instances stop being billed when they are stopped, but are billed for full last hour during which they are running. AWS bills Amazon EC2 instances in instance hours. An instance is billed as soon as it enters the running state, and when an instance enters the shutting down, stopped or terminated we stop billing for the instance. For more information about changing instance states, see Stop and start your instance in the Amazon EC2 User Guide for Linux Instances.

**Note**

Several services measure usage in seconds. See each service page's details to see how your service is measured and billed.

Resources related to the instance might continue to be billed, even if the instance is stopped or terminated. Some examples of these resources include Elastic IPs that were detached but never released, and Amazon Elastic Block Store (Amazon EBS) volumes that might have been associated to the instance but not deleted.

If you run Linux instances, you will be billed per second. For example, if you run your Amazon Linux instance for 30 seconds, you'll be charges for 30 seconds.

For more information, see Amazon EC2 Pricing.
Amazon Machine Images

When you start an Amazon EC2 instance, you must select an Amazon Machine Image (AMI) that is eligible for the AWS Free Tier. Because of licensing restrictions, some AMIs aren't eligible for the AWS Free Tier.

**Important**

Third-party applications or services from AWS Marketplace aren't eligible for the AWS Free Tier.

AMIs that are eligible for the AWS Free Tier are marked in the Amazon EC2 Launch Wizard as **Free tier eligible**. The AWS Free Tier allotment for Linux and Microsoft Windows instances is counted separately. You can run 750 hours of a Linux t3.micro, t2.micro, or t1.micro instance plus 750 hours of a Windows t3.micro, t2.micro, or t1.micro instance each month for the first 12 months.

For more information, see Amazon EC2 pricing.

Tracking your AWS Free Tier usage

You can track your AWS Free Tier usage to help you stay under the AWS Free Tier limits. AWS automatically provides alerts through AWS Budgets to notify you by email when you exceed 85 percent of your AWS Free Tier limits for each service. You can also view the **Top AWS Free Tier Services by Usage** table on the Billing and Cost Management dashboard to see which five services you have used the most and how much you have used them.

**Topics**

- AWS Free Tier usage alerts using AWS Budgets (p. 24)
- Top AWS Free Tier services table (p. 25)
- Trackable AWS Free Tier services (p. 26)

AWS Free Tier usage alerts using AWS Budgets

AWS automatically provides AWS Free Tier usage alerts using AWS Budgets to help you track your AWS Free Tier usage. These AWS Free Tier usage alerts allow AWS to notify you when you're exceeding 85 percent of your usage for the month. For additional AWS Free Tier visibility, you can also use AWS Budgets to track 100 percent of your AWS Free Tier usage for a specific service. AWS Budgets has the additional ability to select usage targets and alert thresholds that you can customize. For example, receive alerts when you're forecasted to exceed 100 percent of your Free Tier usage for Amazon Elastic Block Store. Any usage over the AWS Free Tier limits is charged at the public On-Demand rate.

When you exceed a service-specific AWS Free Tier limit, AWS sends an alert to the email address that you used to create your account. You can change which email address that AWS uses for the alerts on the Billing and Cost Management console. Only one alert per service-specific AWS Free Tier usage type is sent in a month. Usage types are the units that each service uses to measure the usage of a specific type of resource. For example, the `BoxUsage:t2.micro(Hrs)` usage type filters by the running hours of Amazon EC2 t2.micro instances.

**Important**

If you launch more AWS resources than the AWS Free Tier covers in a short period of time, you can exceed the AWS Free Tier limits before AWS can proactively notify you about exceeding the AWS Free Tier usage limits. If that happens, AWS still notifies you that your incurred usage exceeded 85 percent of the AWS Free Tier limit.

AWS Free Tier usage alerts cover non-expiring AWS Free Tier offerings, such as the first 25 GB of Amazon DynamoDB storage or the first 10 custom Amazon CloudWatch metrics. The alerts also cover AWS Free Tier offerings that expire after 12 months, such as the 750 hours per month of Amazon EC2.
Windows t2.micro instance usage and the first 5 GB of standard Amazon S3 storage. For the full list of services and usage types covered by the AWS Free Tier usage alerts, see Trackable AWS Free Tier services (p. 26).

AWS Free Tier usage alerts are enabled automatically for all individual accounts, but not for a management account in an organization in AWS Organizations. If you're an owner of a management account in an organization, or Consolidated Billing family, you can opt in to the usage alerts on the Preferences page on the Billing and Cost Management console. The same AWS Free Tier limit applies to all accounts in an organization (both management account and member accounts), so the same budget also applies to all of the accounts. For example, if Alejandro has a member account and uses 400 Amazon EC2 hours and Mary has a member account and uses 400 Amazon EC2 hours, for a total of 800 hours, the organization has exceeded the AWS Free Tier limit by 50 Amazon EC2 hours.

To opt in or out of AWS Free Tier usage alerts

You can opt in to or out of the AWS Free Tier usage alerts through the Billing and Cost Management console.

2. Under Preferences in the navigation pane, choose Billing preferences.
3. Under Cost Management Preferences, select Receive AWS Free Tier Usage Alerts to opt in to Free Tier usage alerts. To opt out, clear the Receive AWS Free Tier Usage Alerts check box.

To change the email address for AWS Free Tier usage alerts

AWS sends AWS Free Tier usage alerts to the email address that you used when you created your account. You can change the email address on the Billing and Cost Management console.

2. Under Preferences in the navigation pane, choose Billing preferences.
3. Under Cost Management Preferences, under Receive AWS Free Tier Usage Alerts in the Email Address dialog box, enter the email address where you want to receive the usage alerts.
4. Scroll to the end of the page and choose Save preferences.

Top AWS Free Tier services table

If you are eligible for the AWS Free Tier and you use a AWS Free Tier offering, you can track your usage with the Top AWS Free Tier Services by Usage table on the dashboard of the Billing and Cost Management console. The following conditions might limit whether you see the Free Tier table data:

- You use an AWS service that doesn't offer a AWS Free Tier.
- Your AWS Free Tier has expired.
- You access AWS through an AWS Organizations member account.
- You use an AWS service in the AWS GovCloud (US-West) or AWS GovCloud (US-East) Regions.

The Top AWS Free Tier Service by Usage table is grouped by service limit and shows the AWS Free Tier usage limit for your top five most-used Free Tier service measurements, along with your current usage amount. A service might have multiple lines, enabling you to track each AWS Free Tier limit closely. The table shows usage as both a percentage of the AWS Free Tier limit and a ratio of the AWS Free Tier limit.

For example, each month you get 2,000 Amazon S3 Put operations and 5 GB of Amazon S3 storage. The AWS Free Tier usage table has two lines, one for S3 – Puts and one for S3 – Storage. If you
use 2,000 of the Free Tier S3 - PUT operations, the table shows 2,000/2,000 Requests and 100 percent, and if you use 0.55 GB of the AWS Free Tier S3 - Storage, the table shows 0.55/5 GB and 11 percent, as shown in the following screenshot.

To see more details about your AWS Free Tier usage, including all of your active Free Tier services, choose View All in the Top AWS Free Tier Services by Usage table. The detailed table includes additional information such as the forecast of your usage for the month and a status icon to alert you if you have exceeded the limits or are predicted to exceed the limits.

Trackable AWS Free Tier services

AWS enables you to track how much you used AWS Free Tier services and what service usage types you used. Usage types are the specific type of usage that AWS tracks. For example, the usage type Global-BoxUsage:freetier.micro means that you used an Amazon EC2 micro instance.

The AWS Free Tier usage alerts and the Top AWS Free Tier Services by Usage table cover both expiring and non-expiring AWS Free Tier offerings. You can track the following services and usage types.

<table>
<thead>
<tr>
<th>Service</th>
<th>Usage Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon API Gateway</td>
<td>Global-ApiGatewayRequest</td>
</tr>
<tr>
<td>AWS CodeBuild</td>
<td>Global-Build-Min:Linux:g1.small</td>
</tr>
<tr>
<td>Amazon GameLift</td>
<td>Global-BoxUsage:c3.large</td>
</tr>
<tr>
<td>AWS Storage Gateway</td>
<td>Global-Uploaded-Bytes</td>
</tr>
<tr>
<td>Amazon Cloud Directory</td>
<td>Global-Requests-Tier1</td>
</tr>
<tr>
<td></td>
<td>Global-Requests-Tier2</td>
</tr>
<tr>
<td></td>
<td>Global-TimedStorage-ByteHrs</td>
</tr>
<tr>
<td>Amazon CloudFront</td>
<td>Global-DataTransfer-Out-Bytes</td>
</tr>
<tr>
<td></td>
<td>Global-Requests-Tier1</td>
</tr>
<tr>
<td>Amazon Cognito Sync</td>
<td>Global-CognitoSyncOperation</td>
</tr>
<tr>
<td></td>
<td>Global-TimedStorage-ByteHrs</td>
</tr>
<tr>
<td>Service</td>
<td>Usage Type</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Amazon Cognito</td>
<td>Global-CognitoUserPoolMAU</td>
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<tr>
<td>Amazon Connect</td>
<td>USE1-end-customer-mins</td>
</tr>
<tr>
<td>Amazon CloudWatch</td>
<td>Global-CW:Requests</td>
</tr>
<tr>
<td></td>
<td>Global-DataProcessing-Bytes</td>
</tr>
<tr>
<td></td>
<td>Global-TimedStorage-ByteHrs</td>
</tr>
<tr>
<td>Amazon DynamoDB</td>
<td>TimedStorage-ByteHrs</td>
</tr>
<tr>
<td>AWS Database Migration Service</td>
<td>Global-InstanceUsg:dms.t2.micro</td>
</tr>
<tr>
<td>Amazon Elastic Compute Cloud</td>
<td>Global-BoxUsage:freetier.micro</td>
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<tr>
<td></td>
<td>Global-BoxUsage:freetier.micro</td>
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<td>Global-EBS:VolumeI0Usage</td>
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<td></td>
<td>Global-EBS:VolumeUsage</td>
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<tr>
<td></td>
<td>Global-LCUUsage</td>
</tr>
<tr>
<td></td>
<td>Global-LoadBalancerUsage</td>
</tr>
<tr>
<td>Amazon Elastic Container Registry</td>
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Managing your payments

To open an AWS account, you must have a valid payment method on file. Use the procedures in this section to add, update, or remove payment methods and to make payments.

Topics
• Managing your AWS payments (p. 29)
• Managing your payments in India (p. 36)
• Managing your payments in AWS Europe (p. 39)

Managing your AWS payments

You can use the Payment Methods page of the Billing and Cost Management console to manage your AWS payments and payment methods.

Topics
• Managing your AWS payment methods (p. 29)
• Managing your credit card payment methods (p. 32)
• Managing your ACH direct debit payment methods (p. 34)

Managing your AWS payment methods

You can use the Payment Methods page of the Billing and Cost Management console to perform the following tasks for all payment types:

Topics
• View your payment methods (p. 29)
• Designate a default payment method (p. 30)
• Make a payment (p. 30)
• Remove a payment method (p. 30)
• Use China bank redirect payment methods (p. 31)

In addition, you can use the Payment Methods page of the Billing and Cost Management console to manage your credit cards and direct debit accounts. For more information, see Managing your credit card payment methods (p. 32) and Managing your ACH direct debit payment methods (p. 34).

View your payment methods

You can use the console to view the payment methods that are associated with your account.

To view payment methods associated with your AWS account

2. In the navigation pane, choose Payment methods.
Designate a default payment method

You can use the console to designate a default payment method for your AWS account.

To designate a default payment method

2. In the navigation pane, choose Payment methods.
3. Next to the payment method that you want to use as your default payment method, choose Make Default.

Make a payment

AWS charges your default payment method automatically at the beginning of each month. If that charge doesn't process successfully, you can use the console to update your payment method and make a payment.

Note
If you pay by ACH direct debit, AWS provides you with your invoice and initiates the charge to your payment method within 10 days of the start of the month. It can take 3–5 days for your payment to succeed. For more information, see Managing your ACH direct debit payment methods (p. 34).

To make a payment

2. In the navigation pane, choose Payment methods.
3. On the Payment Methods page, ensure that the payment method that you want to use is set as your default payment method.
4. If you are using a credit card, confirm that your card hasn't expired.
5. Choose Make a Payment. You’re redirected to the Orders and invoices page.
6. If your account isn’t past due, the Orders and invoices page shows only your previous invoices in the Order and invoice history section. You don’t need to take any action at this time.
7. If you see a banner that states that you have an overdue payment, choose Verify and pay for the invoice that is overdue in the Payments Due section.

If you pay by ACH direct debit and you receive an email from AWS saying that AWS is unable to charge your bank account and will attempt to charge your account again, work with your bank to understand what went wrong. If you receive an email saying that AWS failed the last attempt to charge your bank account, use the Verify and pay button on the console to pay your invoice. If you have questions about issues with charging your bank account or paying an overdue balance, create a case in the Support Center.

If you pay by electronic funds transfer and your account payment is overdue, create a case in the Support Center.

Remove a payment method

You can use the console to remove a payment method from your account.

To remove a payment method from your AWS account

2. In the navigation pane, choose Payment methods.
3. Ensure that your account has another valid payment method set as the default.
4. Next to the payment method that you want to remove, choose Delete.
5. In the Delete Credit Card or Delete your bank account dialog box, choose Delete.

Use China bank redirect payment methods

If you have overdue payments on your AWS account and you're a China customer with CNY payments enabled, you can use the China bank redirect payment method to complete your payments. With the China bank redirect method, you can make payments in CNY for AWS Inc. invoices up to a total of $50,000 USD at a time.

Note
This payment method is only available for overdue payments and is not available as a default payment method.

Topics
- Requirements to use China bank redirect (p. 31)
- Enabling China bank redirect (p. 31)
- Making payments using China bank redirect (p. 31)

Requirements to use China bank redirect

To enable a China bank account as a payment method, your account must meet the following requirements:

• Your account must be an Amazon Web Services, Inc. customer.
• You must have a China Union Pay credit card payment method (p. 33) in CNY enabled.
• You must have CNY set as your preferred currency.

Enabling China bank redirect

To use China bank redirect, you must enable the payment method on the Billing and Cost Management console. You can only enable China bank redirect when you have overdue invoices.

To enable China bank redirect payments

2. In the navigation pane, choose Orders and Invoices.
3. Next to the invoice that you want to pay, choose Verify and pay.
4. Under China bank redirect, choose Enable bank redirect.

Making payments using China bank redirect

After enabling the payment method, you can use China bank redirect to make payments on your invoices that are past due.

To pay invoices using China bank redirect

2. In the navigation pane, choose **Orders and invoices**.
3. Next to the invoice that you want to pay, choose **Verify and pay**.
4. For **Select payment option**, choose **China bank redirect**.
5. Choose **Complete payment**.
6. To proceed with the redirect, choose **OK**.
7. When you are redirected, choose your bank from the dropdown menu and complete your payment on your bank’s website.
   
   It can take up to 24 hours for your transaction request to process.
8. Within 24 hours, sign in to the Billing and Cost Management console again, and navigate to **Orders and invoices**.
9. Next to the invoice that you want to pay, choose **Verify and pay**.
10. For **Select payment option**, choose **China bank redirect**.
11. Choose **Complete payment**.

### Managing your credit card payment methods

You can use the Payment Methods page of the Billing and Cost Management console to perform the following credit card tasks:

- Add a credit card (p. 32)
- Update your credit card (p. 32)
- Confirm credit card information (p. 33)
- Use a Chinese yuan credit card (p. 33)

### Add a credit card

You can use the console to add a credit card to your account.

**To add a credit card to your AWS account**

2. In the navigation pane, choose **Payment methods**.
3. Choose **Add a card**.
4. Enter the credit card information, and then choose **Continue**.
5. Enter your card billing address.
6. Choose **Continue**.

### Update your credit card

You can update the name, address, or phone number that is associated with your credit card.

**To update your credit card**

2. In the navigation pane, choose **Payment methods**.
3. Next to the credit card that you want to edit, choose **Edit**.
4. Update the information that you want to change.
5. At the bottom on the page, choose Update.

Confirm credit card information

To make a payment, you must have a valid, unexpired credit card on file.

To confirm that your credit card is up to date
2. In the navigation pane, choose Payment methods.
3. Ensure that the Expires On date for your card is in the future. If your card has expired, add a new card or update your current card.

Use a Chinese yuan credit card

If you have an account with AWS Inc., are charged in USD, and are based in China, you can use the following sections to add a Chinese yuan (CNY) credit card to your account.

You can use the Payment Methods page of the Billing and Cost Management console to perform the following tasks:

- the section called “Set up a Chinese yuan credit card” (p. 33)
- the section called “Switch from a Chinese yuan credit card to an international credit card” (p. 34)
- the section called “Add a new Chinese yuan credit card” (p. 34)

Set up a Chinese yuan credit card

To change your preferred currency to CNY and add a credit card, you must have the following information:

- National ID number
- Business license number (if applicable)
- Business license image (if applicable)

After you have the required information, you can use the following procedure to change your preferred currency and add your first Chinese credit card.

To add your first Chinese credit card
2. In the navigation pane, choose Payment methods.
3. Choose Pay with Chinese yuan.
4. In the Setting up Chinese yuan payment dialog box, read the Terms and Conditions for Chinese yuan payments, select I've already read and agree to the above terms and conditions, and choose Next.
5. For Verify customer identity, provide the following information:
   - National ID name
   - Contact number
Managing your ACH direct debit payment methods

If you meet the eligibility requirements, you can add a US bank account as an ACH direct debit payment method to your payment methods.

To be eligible, your account must meet the following requirements:

- It is an Amazon Web Services, Inc. customer.
• It is at least 60 days old.
• It has paid at least one invoice in full in the previous 12 months.
• It has paid at least $100 cumulative over the previous 12 months.
• It uses USD as the preferred currency.

If you pay by ACH direct debit, AWS provides you with your invoice and initiates the charge to your payment method within 10 days of the start of the month. It can take up to 20 days for the payment to complete successfully, even if the payment shows as Succeeded on the Billing and Cost Management console.

You can use the Payment Methods page of the Billing and Cost Management console to perform the following ACH direct debit tasks:

• Add a direct debit account to your AWS payment methods
• Update your linked debit account

To add a direct debit account to your AWS payment methods

You can use the Billing and Cost Management console to add a direct debit account to your AWS payment methods. You can use any personal or business bank account, provided that the account is located at a branch in the US.

To add an ACH direct debit account, you must have the following information ready:

• A US bank account number
• A US bank account routing number
• The address that the bank associates with the account
• (For a personal bank account) A US driver's license number or state-issued ID number
• (For a business bank account) A Federal tax ID number

2. In the navigation pane, choose Payment methods.
3. Choose Add a bank account.
4. For Account Holder Name, enter the name of the principal account holder.
5. For Bank Routing Number, enter the nine-digit routing number.

Routing numbers are always nine digits long. Some banks list the routing number first on a check, and other banks list the account number first.
6. For Bank Account Number, enter the account number. Account numbers might have up to 17 digits. The account must be an ACH-enabled checking account at a bank located in the US.
7. For Bank Account Type, choose Personal or Business.
8. (Personal) For Driver's License Number, enter the primary account holder's valid US driver's license or state-issued ID number.
   For State, enter the name of the state where the ID was issued.
9. (Business) For Federal tax ID, enter the Federal tax ID for the business.
10. For Make Default, select whether you want this direct debit account to be your default payment method.
11. For Billing Address Information, enter the billing address of the primary account holder.
12. Choose Create to agree to the Terms and Conditions and add your direct debit account.
To update your direct debit account

You can update the name, address, or phone number associated with your direct debit account.

2. In the navigation pane, choose Payment methods.
3. Next to the direct debit account that you want to edit, choose Edit.
4. Update the information that you want to change.
5. At the bottom of the dialog box, choose Update.

If you have questions about payment methods, see Getting help with AWS Billing and Cost Management (p. 4).

Managing your payments in India

If your account is with AISPL, follow the procedures in this section to manage your payment methods and payments and to verify credit card payments with your bank. To learn whether your account is with AWS or AISPL, see the procedure Determining Which Company Your Account is With (p. 15).

Note
If you have questions about payment methods, see Getting help with AWS Billing and Cost Management (p. 4).

- Supported payment methods (p. 36)
- View your credit cards (p. 36)
- Add a credit card (p. 37)
- Add a net banking account (p. 37)
- Make a payment using a credit card (p. 37)
- Make a payment using net banking (p. 38)
- Enable recurring payments (p. 38)
- Remove a payment method (p. 38)
- Disable recurring payments (p. 39)
- Activate your subscription (p. 39)

Supported payment methods

AWS supports Visa, Mastercard, and AMEX credit cards for AISPL accounts.

For bank details supporting recurring payments, see Enable recurring payments (p. 38).

View your credit cards

You can use the console to view the credit cards associated with your account.

To view credit cards associated with your AISPL account

2. In the navigation pane, choose Payment Methods.
Add a credit card

You can use the console to add a credit card to your account.

**Note**
AISPL charges your card 2 INR as part of the credit card verification process. AISPL refunds the 2 INR after verification is complete.
If you use Visa or Mastercard, you might be redirected to your bank to authorize the verification charge.

**To add a credit card to your AISPL account**

2. In the navigation pane, choose Payment Methods.
3. Choose Add a card.
4. For the credit card fields, enter the information, including the card verification value (CVV), and then choose Continue.
5. For the credit card information fields, enter your card billing address.
6. (Optional) Select Make Default.
7. Choose Continue.
8. (If you chose Make Default) In the dialog box, choose Ok.

Add a net banking account

You can use the console to add internet banking (Net Banking) accounts as your payment method. This payment option is available to all AISPL customers.

**To add a net banking account to your AISPL account**

2. In the navigation pane, choose Payment Methods.
3. Choose Add an account.
4. Under Net Banking information, select your bank name,
5. In the Billing Address Information section, enter your name, billing address, and phone number.
6. Choose Create.

Make a payment using a credit card

You can use the console to pay your AISPL bills.

**Note**
If your bill is less than 10,000 rupees and you have recurring payments set up, AISPL charges your account two days after you’re billed.

**To pay your AISPL bill**

2. In the navigation pane, choose Orders and invoices.
3. Next to the invoice that you want to pay, choose **Verify and pay**. You’re redirected to your payment methods.

4. On the **Payment Methods** page, select the payment method that you want to use.

5. In the **Make Payment** box, enter the three-digit or four-digit security code of your payment method and then choose **Make Payment**.

6. In the dialog box, choose **Ok**.

7. For Visa and Mastercard payment methods, you’re redirected to your bank to verify your payment. For American Express payment methods, your bank processes your payment with no action required from you. After your payment is verified, you’re redirected to your account page. Your invoice shows the **Verify and pay** link until your bank processes your payment.

Make a payment using net banking

You can use the console to pay your AISPL bills using Net Banking.

**Note**

Due to the current AISPL regulations, you’re redirected to your bank to authorize the charge with each AWS payment. You can't use Net Banking for automatic payments.

To pay your AISPL bill


2. In the navigation pane, choose **Orders and invoices**.

3. Next to the invoice that you want to pay, choose **Verify and pay**. You’re redirected to your payment methods.

4. On the **Payment Methods** page, select your Net Banking account.

5. Choose **Make Payment**.

6. You’re redirected to your bank’s website to verify your payment. Log in and follow the prompts to approve the payment.

7. After your payment is verified, you’re redirected to your account page, which shows a success message at the top.

Enable recurring payments

You can use the console to enable recurring payments for your account.

HDFC, SBI, and Axis Bank don't support recurring payments or auto-charge on their debit cards. However, customers can still use these debit cards to make manual payments.

To enable recurring payments for your AISPL account


2. In the navigation pane, choose **Payment Methods**.

3. Above your credit cards, select the **Recurring payments for default payments enabled** check box.

Remove a payment method

You can use the console to remove a credit card from your account.
To remove a credit card from your AISPL account

2. In the navigation pane, choose Payment Methods.
3. Ensure that your account has another valid payment method set as the default.
4. Next to the card that you want to remove, choose Delete.

Disable recurring payments

To disable recurring payments for your AISPL account

You can use the console to disable recurring payments for your account.

2. In the navigation pane, choose Payment Methods.
3. Above your credit cards, clear the Recurring payments for default payments enabled. check box.
4. In the Are you sure? dialog box, choose Yes.

Activate your subscription

To activate your subscription

You can use the console to activate your subscription.

2. In the navigation pane, choose Orders and invoices.
3. Next to the invoice for your subscription, choose Verify and pay. You're redirected to your payment methods.
4. On the Payment Methods page, select the payment method that you want to use.
5. In the Make Payment box, enter the three-digit or four-digit security code of your payment method and then choose Make Payment.
6. For Visa and Mastercard payment methods, you're redirected to your bank to verify your payment. For American Express payment methods, your bank processes your payment with no action required from you. Once your payment is verified, your subscription is activated, and you're redirected to your account page. Your invoice shows the Verify and pay link until your bank has processed your payment.

Managing your payments in AWS Europe

If your account is with AWS Europe, follow the procedures in this section to manage your payment methods and payments.

Topics

- Managing your AWS Europe payment methods (p. 40)
- Managing your AWS Europe credit card payment methods (p. 41)
Managing your AWS Europe payment methods

You can use the Payment Methods page of the Billing and Cost Management console to perform the following tasks for all payment types:

- View payment methods associated with your account
- Designate a default payment method
- Make a payment
- Remove a payment method from your AWS Europe account

In addition, you can use the Payment Methods page of the Billing and Cost Management console to manage your credit cards and direct debit accounts. For more information, see Managing your credit card payment methods (p. 32) and Managing your SEPA direct debit payment methods (p. 43).

To view payment methods associated with your AWS account

You can use the console to view the payment methods associated with your account.

2. In the navigation pane, choose Payment Methods.

To designate a default payment method

2. In the navigation pane, choose Payment Methods.
3. Next to the payment method that you want to use as your default payment method, choose Make Default.

To make a payment

AWS Europe charges your default payment method automatically at the beginning of each month. If that charge doesn't process successfully, you can use the console to update your payment method and make a payment.

**Note**

If you pay by SEPA direct debit, AWS provides you with your invoice and initiates the charge to your payment method either the following day or the invoice due date, whichever is latest. It can take up to 5 business days for your payment to succeed. For more information, see Managing your SEPA direct debit payment methods (p. 43).

2. In the navigation pane, choose Payment Methods.
3. On the Payment Methods page, ensure that the payment method that you want to use is set as your default payment method.
4. If you're using a credit card, confirm that your card hasn't expired.
5. Choose Make a Payment. You're redirected to the Orders and invoices page.
6. If your account isn't past due, the Orders and invoices page shows only your previous invoices in the Orders and invoice history section. You don't need to take any action at this time.

7. If you see a banner that states that you have an overdue payment, choose Verify and pay for the invoice that is overdue in the Payments Due section.

If you pay by SEPA direct debit and you receive an email from AWS Europe saying that AWS Europe can't charge your bank account and will attempt to charge your account again, work with your bank to understand what went wrong. If you receive an email saying that AWS Europe failed the last attempt to charge your bank account, use the Verify and pay button on the console to pay your invoice. If you have questions about issues with charging your bank account or paying an overdue balance, create a case in the Support Center.

If you pay by electronic funds transfer and your account payment is overdue, create a case in the Support Center.

To remove a payment method from your AWS Europe account

You can use the console to remove a payment method from your account.

2. In the navigation pane, choose Payment Methods.
3. Ensure that your account has another valid payment method set as the default.
4. Next to the payment method that you want to remove, choose Delete.
5. In the Delete Credit Card or Delete your bank account dialog box, choose Delete.

Managing your AWS Europe credit card payment methods

You can use the Payment Methods page of the Billing and Cost Management console to perform the following credit card tasks:

- Add a credit card to your AWS Europe account
- Update your credit card
- Confirm that your credit card is up to date

To add a credit card to your AWS Europe account

You can use the console to add a credit card to your account.

2. In the navigation pane, choose Payment Methods.
3. Choose Add a card.
4. For the credit card fields, enter the information and then choose Continue.
5. For the credit card information fields, enter your card billing address.
6. Choose Continue.

To update your credit card

You can update the name, address, or phone number associated with your credit card.
2. In the navigation pane, choose Payment Methods.
3. Next to the credit card that you want to edit, choose Edit.
4. Update the fields that you want to change.
5. At the bottom on the page, choose Update.

To confirm that your credit card is up to date

You must have a valid, unexpired credit card on file to make a payment.

2. In the navigation pane, choose Payment Methods.
3. Ensure that the Expires On date for your card is in the future. If your card has expired, add a new card or update your current card.

Managing your AWS Europe credit card payment verifications

To comply with the recent EU regulation, your bank might ask you for verification whenever you use a credit card to pay AWS online, add or update a credit card, or register a new AWS account. Banks typically verify by sending unique security codes to credit card holders before online purchases are completed. If your bank needs to verify your payment, you will receive an email from AWS. After verification, you're redirected to the AWS website.

If you prefer not to verify payments, register a bank account as your payment method. For more information about direct debit payment eligibility, see the section called “Managing your SEPA direct debit payment methods”.

To learn more about the EU regulation, see the European Commission’s website.

• the section called “Best practices for verification”
• the section called “Payment verification”
• the section called “Troubleshooting payment verification”
• the section called “AWS Organizations”
• the section called “Subscription purchases”

Best practices for verification

• Confirm that your credit card information is up to date. Banks send verification codes only to the registered card owner.
• Enter the newest code. If you close the authentication portal or request a new code, you might experience a delay in receiving your newest code.
• Enter the code as prompted. Don’t enter the phone number that the code is sent from.

Payment verification

You can use the Billing and Cost Management console to confirm that you payment requires verification or to reattempt any failed payments.
To verify your payment

2. In the navigation pane, choose Orders and invoices.
3. Under Payments due, locate the invoice that you want to pay and choose Verify and pay.
4. On the choose Payment Methods page, select the preferred payment method.
5. Choose Complete payment.
6. If your payment requires verification, you're redirected to your bank's website. To complete verification, follow the provided prompts.

After your bank has processed our payment, you're redirected to the Orders and invoices page.

Note
Your invoice appears with the status of Payment processing until your bank completes the payment process.

Troubleshooting payment verification

If you can't successfully complete your verification, we recommend that you take any of the following actions:

- Contact your bank to confirm that your contact information is up to date
- Contact your bank for details about why your verification has failed
- Clear your cache and cookies or use a different browser
- Navigate to the Payment Methods page of the Billing and Cost Management console and update your billing contact information

AWS Organizations

If you're a member account in AWS Organizations, your purchased services that require upfront payments might not activate until the Management account user verifies the payment. If verification is required, AWS notifies the billing contact of the Management account by email.

Establish a communication process between your Management account and member accounts. To change your payment method, see the section called “Managing your AWS Europe credit card payment methods”.

Subscription purchases

If you purchase multiple subscriptions at a time (or in bulk) and your bank requests verification, the bank might ask you to verify each individual purchase.

Subscriptions can include immediate purchases such as Reserved Instances, Business support plan, and Route 53 domains. Subscriptions don't include AWS Marketplace charges.

Be sure to complete validation for all purchases or register a bank account as your payment method. For more information about eligibility for direct debit payment, see the section called “Managing your SEPA direct debit payment methods”.

Managing your SEPA direct debit payment methods

If you meet the eligibility requirements, you can add an EU bank account as a SEPA direct debit payment method to your payment methods. To meet these requirements, your account must:
• Be an AWS Europe customer
• Have accepted SEPA terms and conditions
• Have paid at least one invoice in full in the previous 12 months
• Have paid at least $100 cumulative over the previous 12 months
• Use euro as the preferred currency

If you pay by SEPA direct debit, AWS provides you with your invoice and initiates the charge to your payment method either the following day or the invoice due date, whichever is latest. It can take up to 5 business days for the payment to complete successfully, even if the payment shows as Succeeded in the Billing and Cost Management console.

You can use the Payment Methods page of the Billing and Cost Management console to perform the following SEPA direct debit tasks:

• Add a direct debit account to your AWS Europe payment methods
• Update your linked debit account

To add a direct debit account to your AWS Europe payment methods

You can use the Billing and Cost Management console to add a direct debit account to your AWS Europe payment methods. You can use any personal or business bank account, provided that the account is located at a branch in a SEPA-supported country.

To add a SEPA direct debit account, you must have the following information ready:

• Bank Identifier Code (BIC)
• International Bank Account Number (IBAN)
• The address that the bank associates with the account

2. In the navigation pane, choose Payment Methods.
3. Choose Add a bank account.
4. For Account Holder Name, enter the name of the principal account holder.
5. For BIC (Swift Code), enter the 8- or 11-digit number.
6. For Confirm BIC (Swift Code), reenter the BIC. Don't copy and paste.
7. For IBAN, enter the digits for the IBAN.
8. For Confirm IBAN, reenter the IBAN. Don't copy and paste.
9. For Make Default, select whether you want this direct debit account to be your default payment method.
10. For Billing Address Information, enter the billing address of the primary account holder.
11. Choose Create to agree to the Terms and Conditions and add your direct debit account.

To update your direct debit account

You can update the name, address, or phone number associated with your direct debit account.

2. In the navigation pane, choose Payment Methods.
3. Next to the direct debit account that you want to edit, choose Edit.
4. Update the fields that you want to change.
5. At the bottom of the dialog box, choose Update.

If you have questions about payment methods, see Getting help with AWS Billing and Cost Management (p. 4).
You receive AWS invoices monthly for usage charges and recurring fees. For one-time fees, such as fees for purchasing an All Upfront Reserved Instance, you are charged immediately.

At any time, you can view estimated charges for the current month and final charges for previous months. This section describes how to view your monthly bill and past bills and how to receive and read billing reports.

**Topics**

- Viewing your monthly charges (p. 46)
- Getting an invoice emailed to you (p. 47)
- Cost and Usage Reports
- Managing Your Payments (p. 29)

**Viewing your monthly charges**

At the end of a billing cycle or at the time you choose to incur a one-time fee, AWS charges the credit card you have on file and issues your invoice as a PDF file. You can download the PDF from the Account Activity page in the Billing and Cost Management console using the following steps.

**Note**
IAM users need explicit permission to see some of the pages in the Billing and Cost Management console.

**To view your monthly charges**

2. In the navigation pane, choose Bills.
3. For Date, choose a month.

   The Summary section displays a summary and details of your charges for that month. It is not an invoice, however, until the month's activity closes and AWS calculates final charges.

   If you use the consolidated billing feature in AWS Organizations, the Bills page lists totals for all accounts on the Consolidated Bill Details tab. Choose the Bill Details by Account tab to see the activity for each account in the organization. For more information about consolidated billing, see Consolidated billing for AWS Organizations (p. 155).

**To view your charges for a different month**

- On the Bills page, select the month you want from the Date list.

**To download a copy of your charges as a PDF document**

1. On the Bills page, select a month from the Date list for which all activity is closed.
2. On the Summary tab, choose Usage Charges and Recurring Fees.
3. Choose the Invoice <invoiceID> link.
To download a monthly report

- Choose the Download CSV button, and then choose the appropriate option.

Getting an invoice emailed to you

Follow these steps to have a PDF copy of your monthly invoice sent to the email address associated with your account.

To edit your email recipients, see Editing contact information (p. 11).

2. Choose Billing preferences on the navigation pane.
3. Select the Receive PDF Invoice by Email check box.
4. Choose Save preferences.
Managing your purchase orders

You can use your Billing and Cost Management console to manage your purchase orders and configure how they reflect on your invoices. You have the option to add multiple purchase orders with multiple line items. Based on your configurations, we select the purchase order that best matches with your invoice. You can manage purchase orders if you’re using a regular AWS account or an AWS Organizations management account.

Each purchase order can have several line items, and every line item is used for matching with invoices. The following types of line items are available:

- **ALL** – All charges on your AWS account.
- **AWS Monthly Usage** – Your AWS monthly invoice charges.
- **AWS Subscription Purchase** – Your subscription invoice charges; for example, upfront charges for Reserved Instances (RI) and AWS Support charges.
- **AWS Marketplace Purchase** – Your AWS Marketplace invoice charges. This is only available for the AWS Inc. entity, because all AWS Marketplace invoices are generated from AWS Inc.

Many criteria and parameters are used to determine the optimal purchase order for your invoices. You can create up to 100 active purchase orders with up to 100 line items for each regular account or AWS Organizations management account.

When an invoice is generated, all purchase orders that are added to your management account are considered for association. Then, expired or suspended purchase orders are filtered out, leaving only the active purchase orders. Your invoice's billing entity is matched with the “Bill from” entity in your purchase order, filtering out those that don’t match. For example, if you have a purchase order added for the AWS Inc. entity (PO_1), and another one for the AWS EMEA SARL entity (PO_2). If you purchase a Reserved Instance from AWS Europe, only PO_2 will be considered for invoice association.

Next, we evaluate line item configurations to determine the best fit for your invoice. To be matched with a line item, the invoice's creation date must be within the line item's start and end month, and it must also match the line item type. If multiple line items match, we use the line item with the most specific type for invoice association. For example, if you have an RI invoice, we use the subscription line item instead of ALL if both are configured.

Lastly, the line items with enough balance to cover your invoice amount are selected above the out of balance line items. If line items that belong to multiple purchase orders match all criteria precisely, we use the purchase order that was most recently updated to match the invoice.

**Topics**

- Setting up purchase order configurations (p. 48)
- Adding a purchase order (p. 50)
- Editing your purchase orders (p. 51)
- Deleting your purchase orders (p. 53)
- Viewing your purchase orders (p. 53)
- Reading your purchase order details page (p. 53)
- Enabling purchase order notifications (p. 54)

**Setting up purchase order configurations**

You can use purchase orders and their line item attributes to flexibly define a configuration that best fits your needs. The following are examples of purchase order configuration scenarios that you can use.
You can configure separate purchase orders for different time periods by choosing distinct effective and expiration months.

**Example Example 1**

If you use monthly purchase orders, you can define one purchase order for each month by selecting the same effective and expiration month for each purchase order. The purchase order will only apply to invoices that are generated during that month.

Here are a few purchase order configurations that you can use for this setup:

- **PO #M1_2021** with the effective month set to Jan 2021 and expiration month Jan 2021.
- **PO #M2_2021** with the effective month set to Feb 2021 and expiration month Feb 2021.
- **PO #M3_2021** with the effective month set to Mar 2021 and expiration month Mar 2021.

Here is an example of how you can also define a purchase order for a particular quarter, half-year, or the entire year:

- **PO #Q4_2021** with the effective month set to Apr 2021 and expiration month Jun 2021.
- **PO #2H_2021** with the effective month set to Jul 2021 and expiration month Dec 2021.
- **PO #2022Y** with the effective month set to Jan 2022 and expiration month as Dec 2022.

**Example Example 2**

You can configure separate purchase orders for different types of invoices through line item configurations.

- **PO #Anniversary_Q4_2021** with the effective month set to Apr 2021, and expiration month Jun 2021, Line item type = AWS monthly usage.
- **PO #Subscriptions_Q4_2021** with the effective month set to Apr 2021, and expiration month Jun 2021, Line item type = AWS Subscription Purchase.
- **PO #Marketplace_Q4_2021** with the effective month set to Apr 2021, and expiration month Jun 2021, Line item type = AWS Marketplace Purchase.

You can track the balance of a given purchase order for different time periods by configuring granular line item start and end months.

**Example Example 3**

Consider **PO #Q4_2021** from Example 1 with an effective month of Apr 2021 and an expiration month Jun 2021. You can track this PO's balance on a monthly basis by setting up the following line items:

- **Line item #1** with the start month Apr 2021, end month Apr 2021, Line item type = ALL.
- **Line item #2** with the start month May 2021, end month May 2021, Line item type = ALL.
- **Line item #3** with the start month Jun 2021, end month Jun 2021, Line item type = ALL.

Alternatively, you can track balance for each line item type separately for the same purchase order and time period.

**Example Example 4**

The same **PO #Q4_2021** from Example 1 can be set up using the following configuration to track balance of different line item types separately.
Adding a purchase order

You can use the Billing and Cost Management console to add purchase orders to use in your invoices. Adding a purchase order is a two-step process involving purchase orders and line item configurations. First, you enter your purchase order details (for example, purchase order ID, shipping address, effective and expiration month). Then, you define the purchase order line item configurations that are used to match the purchase order with an invoice. If you add multiple purchase orders, we use the purchase order that has the line item best matching the invoice being generated.

To add a purchase order

2. In the navigation pane, choose Purchase orders.
3. Choose Add purchase order.
4. For Purchase order ID, enter your purchase order ID. Purchase order IDs must be unique within your account. For details about character restrictions for your purchase ID, see Purchase orders (p. 197).
5. (Optional) For Description, describe your purchase order, including any notes for your reference.
6. For Ship to, enter your shipping address.
   (Optional) Select Copy Bill to address to copy and edit the address populated from your Bill to field.
7. For Bill from, choose the AWS billing entity that you are invoiced from.
   
   **Note**
   
   Remittance details are different for each Bill from location. Be sure to verify your Bill from selection. You must make your payments to the legal entity that you're billed from. We don't recommend configuring more than one Bill from location for a purchase order.
8. For Effective month, choose the month you want your purchase order to start from. Your purchase order is eligible for invoice associations starting from this month.
9. For **Expiration month**, choose the month you want your purchase order to end. Your purchase order expires at the end of this month, and is not used for invoice associations going forward.

10. (Optional) For **Purchase order contacts**, enter the contact name, email address, and phone number. You can add up to 10 contacts.

11. Choose **Configure line items**.

12. For **Line item number**, enter your line item number.

13. (Optional) For **Description**, enter a description for your line item.

14. For **Line item type**, choose your preferred line item type. For a detailed description for each line item type, see Managing your purchase orders (p. 48).

15. For **Start month**, choose the month you want your line item to start from. This date cannot be earlier than your purchase order **Effective month**.

16. For **End month**, choose the month you want your line item to end. This date cannot be later than your purchase order **Expiration month**.

17. (Optional) Choose **Enable balance tracking** to track the balance of your line item.

18. For **Amount**, enter the total amount of your purchase order line item.

19. For **Quantity**, enter the quantity amount.

20. (Optional) For **Tax**, enter the tax amount. This can be an absolute value or a percentage of the line item amount.

   For **Tax type**, choose **% of amount** to enter a percentage, or **amount in $** to enter an absolute tax amount.

21. To add other line items, choose **Add new line item**. You can add up to 100 line items.

22. Choose **Submit purchase order**.

Some fields are automatically filled and cannot be edited. Here is a list of where the automated fields are referenced from.

- **Bill to** – The Bill to address for your invoice. This field is included as a reference, because your purchase order billing address should match your invoice billing address.
- **Payment terms** – Your negotiated payment terms.
- **Currency** – Your preferred invoice currency.

### Editing your purchase orders

You can edit your purchase order, line item information, and status using the Billing and Cost Management console. You can't change your purchase order ID in this process.

#### To edit a purchase order

2. In the navigation pane, choose **Purchase orders**.
3. Select the purchase order that you want to edit.
4. Choose **Edit purchase order**.
5. Change any parameter of your choice. Purchase order IDs cannot be changed.
6. Choose **Configure line items**.
7. Choose **Submit purchase order**.

#### To update contacts

2. In the navigation pane, choose **Purchase orders**.
3. Choose the purchase order that you want to edit.
4. Choose **Manage contacts**.
5. Change the contacts information as needed.
6. Choose **Save changes**.

**To change the status of your purchase order**

2. In the navigation pane, choose **Purchase orders**.
3. Choose the purchase order that you want to edit.
4. Choose **Change status**.
5. Choose a status:
   - **Suspended** – Your purchase order will no longer be used for invoice association.
   - **Active** – Your purchase order will be used for invoice association.
6. Choose **Change status**.

**Note**

You can use a suspended purchase order for invoice association when it is past its expiration date and set to **Suspended-Expired** status. To do so, you must change the status to **Expired** and update the expiration month to make it **Active**. Be sure to update your line item end months accordingly.

**To add a line item**

2. In the navigation pane, choose **Purchase orders**.
3. Choose the purchase order you want to edit.
4. In the **Line items** section, choose **Add line item**.
5. Change the information as needed.
6. Choose **Save line item**.

**To edit a line item**

2. In the navigation pane, choose **Purchase orders**.
3. Choose the purchase order you want to edit.
4. In the **Line items** section, choose **Edit**.
5. Change the line item information as needed.
6. Choose **Save line item**.

**To delete a line item**

2. In the navigation pane, choose **Purchase orders**.
3. Choose the purchase order you want to edit.
4. Select all of the line items to delete in the **Line items** section.
5. Choose **Delete**.
6. Choose Confirm.

Deleting your purchase orders

You can use the Billing and Cost Management console to delete your purchase order at any time, along with all of its notifications and associated contacts. A deleted purchase order can’t be recovered.

To delete a purchase order
2. In the navigation pane, choose Purchase orders.
3. Select all of the purchase orders that you want to delete.
4. Choose Delete purchase order.
5. Choose Confirm.

Viewing your purchase orders

Your purchase order dashboard on the Billing and Cost Management console shows you the state of your purchase orders at a glance. Your purchase orders are listed on the dashboard, along with the following information.

- Purchase order ID – The unique identifier for your purchase order.
- Value – Your purchase order amount. This is the sum of all line item amounts.
- Balance – The sum of all line item balances. This sum is updated whenever an invoice is associated.
- Effective and Expiration – The start and end of your purchase order ID.
- Status – The current status of your purchase order.
- Updated on – The most recent date you updated your purchase order.

To view your purchase orders
2. In the navigation pane, choose Purchase orders.
3. Choose a purchase order to see the Purchase order details page.

Reading your purchase order details page

You can review the contents of your individual purchase orders on the Purchase order details page of the Billing and Cost Management console.

To change your purchase order or line items, see Editing your purchase orders (p. 51).

- Bill to – The address reflected on your invoice. To change your billing address, update the information from your Payment methods.
- Ship to – Your purchase order’s shipping address.
- Bill from – The AWS legal entity you’re billed from.
- Payment terms – Your negotiated AWS payment terms.
- Currency – Your preferred invoice payment currency.
• **Effective month** – The month your purchase order is effective from. Your purchase order is used for generated invoices starting this month.
• **Expiration month** – The month your purchase order expires. Your purchase order is not used for any invoices that are generated past this month.
• **Contacts** – A list of all contacts for this purchase order. Choose **Manage contacts** to see all listed.
• **Status** – The current status of your purchase order.
  • **Active** – Eligible for invoice association.
  • **Suspended** – Not eligible for invoice association. You can suspend an active or expired purchase order.
  • **Expired** – A purchase order that is past its expiration date, and is no longer eligible for invoice association.
  • **Suspended-expired** – A suspended purchase order that is also past its expiration date.
• **Balance amount** – The balance remaining on your purchase order. This is the total balance amount of all line items configured on your purchase order.
• **Total amount** – The sum of your total values for all line items configured in your purchase order.
• **Line items** – The line item details you used when adding the purchase order.
  • **Number** – The unique identifier for your line item.
  • **Type** – Your line item type.
  • **Start month** – The month that your line is effective from. The line item is eligible for invoice association from this month.
  • **End month** – The month your line item expires. The line item is not eligible for invoice association at the end of this month.
  • **Amount** – The unit price amount.
  • **Quantity** – The number of units.
  • **Tax** – The tax amount.
  • **Total value** – The total value of amount for the particular line item.
  • **Current balance** – The remaining balance after subtracting the total amount of all invoices matched with this line item. To see details for all invoices matching this line item, see the invoices table.
• **Invoices** – All invoices associated with your purchase order.
  • **Date issued** – The date when the invoice was issued.
  • **Type** – The type of invoice. For example, invoice and credit memo.
  • **ID** – The unique identifier of the invoice.
  • **Line item number** – The line item number of your purchase order, associated with the invoice.
  • **Amount** – The invoice amount.
  • **Due date** – Your payment due date for the invoice.

### Enabling purchase order notifications

You can enable email notifications on the Billing and Cost Management console by adding contacts to your purchase orders. You need at least one purchase order contact added to receive notifications.

Notifications are beneficial to proactively take action on your expiring, or out of balance purchase orders. This helps you make payments without delay. To update your contacts information, see **Editing your purchase orders** (p. 51).

Purchase order notifications are sent to your contacts for the following scenarios:

• **Balance tracking** – When your purchase order’s line item balance drops below the 75% threshold. The purchase order balance is tracked at the line item level, and must be enabled at each level.
• Expiration tracking – When your purchase order is approaching its expiration. Your contacts receive notifications leading up to your expiration date. If your purchase order expiration is less than one month away, notifications are sent one week prior and on the expiration date. If your expiration date is one to three months away, a notification is sent one month before the expiration date. If the expiration is more than three months away, notifications are sent two months before the expiration date.
Monitoring your usage and costs

You can monitor your AWS usage with the following methods.

For information about, see the Cost and Usage Report Guide.

Topics
- Reading your dashboard graphs (p. 56)
- Analyzing your costs with Cost Explorer (p. 57)
- Managing your costs with AWS Budgets (p. 95)
- Reporting your budget metrics with budget reports (p. 115)
- Detecting unusual spend with anomaly detection (p. 117)
- Managing your costs with AWS Cost Categories (p. 123)
- Using Cost Allocation Tags (p. 127)
- Using the AWS Price List API (p. 137)
- Logging Billing and Cost Management API calls with AWS CloudTrail (p. 148)
- Avoiding unexpected charges (p. 151)

Reading your dashboard graphs

Even if you're using the free tier, it's a good idea to periodically check the Billing and Cost Management console dashboard. From the dashboard, you can check various graphs that show different breakdowns of your AWS usage.

On the dashboard you can view the following graphs:

- Spend Summary
- Month-to-Date Spend by Service
- Month-to-Date Top Services by Spend

Spend Summary

The Spend Summary graph shows you how much you spent last month, the estimated costs of your AWS usage for the month-to-date, and a forecast for how much you are likely to spend this month. The forecast is an estimate based on your past AWS costs, so your actual monthly costs might not match the forecast.

Month-to-Date Spend by Service

The Month-to-Date Spend by Service graph shows the top services that you use most and the proportion of your costs that that service contributed to. The Month-to-Date Spend by Service graph doesn't include forecasting.

Month-to-Date Top Services by Spend

The Month-to-Date Top Services by Spend graph shows the services that you use most, along with the costs incurred for the month to date. The Month-to-Date Top Services by Spend graph doesn't include forecasting.
Opening the Billing and Cost Management console and dashboard

To open the Billing and Cost Management console and dashboard

- Sign in to the AWS Management Console and open the Billing and Cost Management console at https://console.aws.amazon.com/billing/.

  The console opens to the **Dashboard**, where you can see your current month-to-date usage graphs.

Analyzing your costs with Cost Explorer

Cost Explorer is a tool that enables you to view and analyze your costs and usage. You can explore your usage and costs using the main graph, the Cost Explorer cost and usage reports, or the Cost Explorer RI reports. You can view data for up to the last 12 months, forecast how much you're likely to spend for the next 12 months, and get recommendations for what Reserved Instances to purchase. You can use Cost Explorer to identify areas that need further inquiry and see trends that you can use to understand your costs.

You can view your costs and usage using the Cost Explorer user interface free of charge. You can also access your data programmatically using the Cost Explorer API. Each paginated API request incurs a charge of $0.01. You can't disable Cost Explorer after you enable it.

In addition, Cost Explorer provides preconfigured views that display at-a-glance information about your cost trends and give you a head start on customizing views that suit your needs.

When you first sign up for Cost Explorer, AWS prepares the data about your costs for the current month and the last 12 months, and then calculates the forecast for the next 12 months. The current month's data is available for viewing in about 24 hours. The rest of your data takes a few days longer. Cost Explorer updates your cost data at least once every 24 hours. After you sign up, Cost Explorer can display up to 12 months of historical data (if you have that much), the current month, and the forecasted costs for the next 12 months. The first time that you use Cost Explorer, Cost Explorer walks you through the main parts of the console with an explanation for each section. You can trigger this walkthrough at a later time as well. For more information, see To trigger the Cost Explorer walkthrough (p. 60).

Cost Explorer uses the same dataset that is used to generate the AWS Cost and Usage Reports and the detailed billing reports. For a comprehensive review of the data, you can download it into a comma-separated value (CSV) file.

**Topics**

- Enabling Cost Explorer (p. 57)
- Getting started with Cost Explorer (p. 60)
- Exploring your data using Cost Explorer (p. 61)
- Using Cost Explorer reports (p. 75)
- Understanding your reservations with Cost Explorer (p. 82)
- Optimizing your cost with Rightsizing Recommendations (p. 89)
- Using the AWS Cost Explorer API (p. 93)

Enabling Cost Explorer

You can enable Cost Explorer for your account using this procedure on the Billing and Cost Management console. You can't enable Cost Explorer using the API. After you enable Cost Explorer, AWS prepares the
data about your costs for the current month and the last 12 months, and then calculates the forecast for the next 12 months. The current month's data is available for viewing in about 24 hours. The rest of your data takes a few days longer. Cost Explorer updates your cost data at least once every 24 hours.

By default, you can launch Cost Explorer if your account is a member account in an organization. The management account can, however, block your access. For more information, see Consolidated billing for AWS Organizations (p. 155).

Note
An account's status with an organization affects what cost and usage data is visible:

- When a standalone account joins an organization, the account no longer has access to cost and usage data from the time range when the account was a standalone account.
- If a member account leaves an organization and becomes a standalone account, the account no longer has access to cost and usage data from the time range when the account was a member of the organization. The account has access only to the data that is generated as a standalone account.
- If a member account leaves organization A to join organization B, the account no longer has access to cost and usage data from the time range when the account was a member of organization A. The account has access only to the data that is generated as a member of organization B.
- If an account rejoins an organization that it previously belonged to, the account regains access to its historical cost and usage data.

Signing up to receive the AWS Cost and Usage Reports or the Detailed Billing Report doesn't automatically enable Cost Explorer. You must still enable it by performing the following procedure.

To sign up for Cost Explorer

2. On the navigation pane, choose Cost Explorer.

For more information about controlling access to Cost Explorer, see Controlling access for Cost Explorer (p. 58).

Controlling access for Cost Explorer

You can manage access to your Cost Explorer in the following ways:

- The management account can enable Cost Explorer at a root level, automatically enabling all member accounts.
- After member accounts are enabled, the management account can use the Cost Explorer settings to control the level of information you want to expose in Cost Explorer. Levels of information can include cost, refunds or credits, discounts (for example, reservation volume discounts, bundled discounts), and Reserved Instance (RI) recommendations.
- After you enable Cost Explorer at the management account level, you can control the IAM policies of your IAM users to restrict access to Cost Explorer at the account level. Users either get all access or no access with this option.

This topic provides details about how to control access in Cost Explorer.

For information about managing access to Billing and Cost Management pages, see Overview of managing access permissions (p. 172).
To reference Cost Explorer IAM policies, see Using identity-based policies (IAM policies) for Billing and Cost Management (p. 173).

For more information about consolidated billing, see Consolidated billing for AWS Organizations (p. 155).

Topics

• Granting Cost Explorer access (p. 59)
• Controlling access using Cost Explorer preferences (p. 59)
• Cost Explorer and IAM users (p. 60)

Granting Cost Explorer access

You can enable Cost Explorer access if you are signed into the management account with your root credentials through the Billing and Cost Management console. Enabling Cost Explorer at the management account level enables Cost Explorer for all of your organization accounts. All accounts in the organization are granted access, and you can't grant or deny access individually.

Controlling access using Cost Explorer preferences

A management account can grant access to Cost Explorer for all or none of the member accounts. Access isn't customizable for each individual member account.

The management account in AWS Organizations has full access to all Billing and Cost Management information for costs incurred by both the management account and member accounts. Member accounts only have access to their own cost and usage data in Cost Explorer.

The owner of a management account can:

• View all costs in Cost Explorer.
• Grant all member accounts the permission to see the costs for their own member account, refunds, credits, and RI recommendations.

Member account owners can't see costs, refunds, and RI recommendations for other accounts in the Organizations. For more information about consolidated billing, see Consolidated billing for AWS Organizations (p. 155).

If you're an AWS account owner and not using consolidated billing, you have full access to all Billing and Cost Management information including Cost Explorer.

Organizations account status use cases

An account's status with an organization affects what cost and usage data is visible in the following ways:

• If a standalone account joins an organization, the account loses access to cost and usage data from when the account was a standalone account.

• If a member account leaves an organization and becomes a standalone account, the account no longer has access to cost and usage data from when the account was a member of their previous organization. The account only has access to the data that is generated as a standalone account.

• If a member account leaves organization A to join organization B, the account no longer has access to cost and usage data from organization A. The account has access only to the data that is generated as a member of organization B.

• If an account rejoins an organization that it previously belonged to, the account regains access to its historical cost and usage data.
Controlling member accounts’ access using Cost Explorer preferences

You can grant or restrict the access to all member accounts in your Organizations. When you enable your account at the management account level, all member accounts are granted access to their cost and usage data by default.

To control member account access to Cost Explorer data

2. In the navigation pane, choose **Cost Explorer**.
3. On the Cost Explorer page, choose **Launch Cost Explorer**.
4. In the navigation pane, choose **Preferences**.
5. On the **Preferences** page, select or clear the **Linked Account Access** check box.
6. Choose **Save**.

Cost Explorer and IAM users

After you enable Cost Explorer at the management account level, you can use IAM to manage access to your billing data for individual IAM users. This enables you to grant or revoke access on an individual level for each account, rather than granting access to all member accounts.

An IAM user must be granted explicit permission to view pages in the Billing and Cost Management console. With the appropriate permissions, the IAM user can view costs for the AWS account that the IAM user belongs to. For the policy that grants the necessary permissions to an IAM user, see Overview of managing access permissions (p. 172).

Getting started with Cost Explorer

After you enable Cost Explorer, you can launch it from the Billing and Cost Management console.

Starting Cost Explorer

Start Cost Explorer by opening the Billing and Cost Management console and choosing **Launch Cost Explorer**.

To open Cost Explorer

2. In the navigation pane, choose **Cost Explorer**.
3. On the Cost Explorer page, choose **Launch Cost Explorer**.

Cost Explorer opens to the **Monthly Amazon EC2 running hours costs and usage** saved report.

To trigger the Cost Explorer walkthrough

The first time that you use Cost Explorer, Cost Explorer walks you through the main sections of the console. You can trigger this walkthrough again at any time with the following procedure.

2. In the navigation pane, choose **Cost Explorer**.
3. On the **Cost Explorer** page, choose **Launch Cost Explorer**.
4. On the service bar, choose ? and choose **View Cost Explorer tutorial**.
Exploring your data using Cost Explorer

On the Cost Explorer dashboard, Cost Explorer shows your estimated costs for the month to date, your forecasted costs for the month, a graph of your daily costs, your five top cost trends, and a list of reports that you recently viewed.

All costs reflect your usage up to the previous day. For example, if today is December 2, the data includes your usage through December 1.

- Your Cost Explorer costs (p. 61)
- Your Cost Explorer trends (p. 61)
- Your daily unblended costs (p. 61)
- Your monthly unblended costs (p. 62)
- Your net unblended costs (p. 62)
- Your recent Cost Explorer reports (p. 62)
- Your amortized costs (p. 62)

Navigating Cost Explorer

You can use the icons in the left pane to do the following:

- Go to the main Cost Explorer dashboard
- See a list of the default Cost Explorer reports
- See a list of your saved reports
- See information about your reservations
- See your reservation recommendations

Your Cost Explorer costs

At the top of the Cost Explorer page are the Month-to-date costs and Forecasted month end costs. The Month-to-date costs shows how much you're estimated to have incurred in charges so far this month and compares it to this time last month. The Forecasted month end costs shows how much Cost Explorer estimates that you will owe at the end of the month and compares your estimates costs to your actual costs of the previous month. The Month-to-date costs and the Forecasted month end costs don't include refunds.

Your Cost Explorer trends

In the this month trends section, Cost Explorer shows your top cost trends. For example, your costs related to a specific service have gone up, or your costs from a specific type of RI have gone up. To see all of your costs trends, choose View all trends in the upper-right corner of the trend section.

To understand a trend in more depth, choose it. You're taken to a Cost Explorer chart that shows the costs that went into calculating that trend.

Your daily unblended costs

In the center of the Cost Explorer dashboard, Cost Explorer shows a graph of your current unblended daily costs. You can access the filters and parameters used to create the graph by choosing Explore costs in the upper-right corner. That takes you to the Cost Explorer report page, enabling you to access the default Cost Explorer reports and modify the parameters used to create the chart. The Cost Explorer reports offer additional functionality such as downloading your data as a CSV file and saving your
specific parameters as a report. For more information, see Using Cost Explorer reports (p. 75). Your daily unblended costs don't include refunds.

**Your monthly unblended costs**

**Monthly granularity**

You can view your unblended costs at the monthly granularity and see the discounts applied to your monthly bill. You can see this by opening the Cost Explorer page and choosing **Cost Explorer** from the navigation pane. Discounts appear as the **RI Volume Discount** in the chart. The discount amount aligns with the discount amount shown in your Billing and Cost Management console.

**To see the details in your Billing and Cost Management console**

2. In the navigation pane, choose **Bills**.
3. To display the discount, select the arrow next to **Total Discounts**, under **Credits, Total Discounts and Tax Invoices**.

**Monthly gross charges**

You can view your gross monthly charges by excluding the **RI Volume Discount**.

**To exclude RI volume discounts in your monthly view**

2. In the navigation pane, choose **Cost Explorer**.
3. Select **Launch Cost Explorer**.
4. In the left pane, choose **Cost Explorer**.
5. Choose **Cost & Usage**.
6. On the **Filters** pane, choose **Charge Type**.
7. Select **RI Volume Discount**.
8. To open a dropdown, select **Include only** and choose **Exclude only**.
9. Select **Apply filters**.

**Your net unblended costs**

This enables you to see your net costs after all applicable discounts are calculated. You should still exclude any manual adjustment such as refunds and credits as a best practice. **RI Volume Discounts** are no longer visible because these are post-discount amounts.

**Your recent Cost Explorer reports**

At the bottom of the Cost Explorer dashboard is a list of reports that you have accessed recently, when you accessed them, and a link back to the report. This enables you to switch between reports or remember the reports that you find most useful.

For more information about Cost Explorer reports, see Using Cost Explorer reports (p. 75).

**Your amortized costs**

This enables you to see the cost of the RI purchases spread across the usage of the reservation. AWS estimates your amortized costs by combining the unblended upfront and recurring reservation fees and
calculating the effective rate of applicable instances. In the daily view, Cost Explorer shows the unused portion of your reservation fees at the first of the month or the date of purchase.

Using the Cost Explorer chart

You can view your costs as either a cash-based view (costs are recorded when cash is received or paid) with unblended costs or as an accrual-based view (costs are recorded when income is earned or costs are incurred). You can view data for up to the last 12 months and forecast how much you are likely to spend for the next three months. You can also specify time ranges for the data and view time data by day or by month.

Cost Explorer automatically uses the Group By filter for the Daily unblended costs graph. When using the Group By filter, the Cost Explorer chart displays data for up to six values in the Group By filter. If your data contains additional values, the chart displays five bars or lines and then aggregates all remaining items in a sixth. The data table below the chart breaks out the data for individual services that are aggregated in the chart.

Topics
- Modifying your chart (p. 63)
- Reading the Cost Explorer data table (p. 74)
- Forecasting with Cost Explorer (p. 74)

Modifying your chart

You can modify the parameters that Cost Explorer uses to create your chart, enabling you to explore different sets of data.

- Selecting a style for your chart (p. 63)
- Choosing time ranges for the data that you want to view (p. 63)
- Grouping data by filter type (p. 65)
- Filtering the data that you want to view (p. 65)
- Choosing advanced options (p. 73)

Selecting a style for your chart

Cost Explorer provides two styles for charting your cost data: bar charts (Bar) or line graphs (Line). You can set the style by using the view dropdown.

Choosing time ranges for the data that you want to view

You can choose to view your cost data in monthly or daily levels of granularity. You can use preconfigured time ranges or set custom start and end dates.

To set the granularity and time range for your data

1. Start Cost Explorer.
2. Choose a time granularity of Daily, Monthly, or Hourly.
   
   Note
   To enable hourly granularity, opt-in through the Cost Explorer settings page as the management account. Once enabled, information for the previous 14 days are available.
3. For your monthly or daily data, open the calendar and define a custom period for your report or choose a preconfigured period at the bottom of the calendar. You can choose from a number of historical or forecast time periods. The name of the period that you choose appears in the calendar.
4. Choose Apply.
Historical time range options

In Cost Explorer, months are defined as calendar months. Days are defined as 12:00:00 AM to 11:59:59 PM. Based on these definitions, when you choose Last 3 Months for a date range, you see cost data for three previous months, not including the present month. For example, if you view your chart on June 6, 2017, and select Last 3 Months, your chart includes data for March, April, and May 2017. All times are in Universal Coordinated Time (UTC).

You can choose time ranges for both your past costs and your forecasted future costs.

The following list defines each time range option for your past costs in Cost Explorer.

- Custom
  - Displays data for the time range for the From and To dates that you specify with calendar controls.
- 7D (Last 7 Days)
  - Displays cost data from the current day and the previous six days.
- 14D (Last 14 Days)
  - Displays cost data from the current day and the previous 13 days.
- MTD (Month-to-Date)
  - Displays cost data for the current calendar month.
- 1M (Last Month)
  - Displays cost data from the last month.
- 3M (Last 3 Months)
  - Includes cost data from the previous three months but does not include the current month.
- 6M (Last 6 Months)
  - Includes cost data from the previous six months but does not include the current month.
- YTD (Year-to-Date)
  - Displays cost data from the current calendar year.
- 1Y (Last Year)
  - Displays cost data from the last calendar year.

Forecast time range options

The following list defines each time range option for your forecast costs in Cost Explorer. You can select a Historical time period and a Forecasted period to display together. For example, you can select a Historical period of one month (1M) and select a Forecasted period of three months (3M). Your report includes historical data for the previous month plus forecasted data for the next 3 months. To clear a Historical time period and see only the forecast, choose the Historical period again.

**Note**

If you choose any Forecasted dates, your current date's cost and usage data shows as Forecast. The current date's cost and usage will not include historical data.

- Custom
  - Displays forecast data for the time range in the From and To dates that you specify with calendar controls.
- EOM (End of Month)
Displays data for the historical time period that you choose plus a forecast to the end of the current month.

- **+1M**

  Displays forecast data for the current day plus the next month.

- **+3M**

  Displays forecast data for the current day and the next 3 months.

**Grouping data by filter type**

Use the **Group by** button to have Cost Explorer display the cost data groups by filter type. By default, Cost Explorer doesn't use grouping. Forecasting isn't available for charts that have grouping. If you don't select a **Group by** option, Cost Explorer displays total costs for the specified date range.

**To group your data by filter type**

1. Launch Cost Explorer.
2. (Optional) Use the **Filter** controls to configure a view of your cost data.
3. Choose **Group By** to group by the option that you want. The data table below the chart also groups your cost figures by the option you selected.

**Filtering the data that you want to view**

With Cost Explorer, you can filter how you view your AWS costs by one or more of the following values:

- **API operation**
- **Availability Zone (AZ)**
- **Billing Entity**
- **Charge Types**
- **Include All**
- **Instance Type**
- **Legal Entity**
- **Linked Account**
- **Platform**
- **Purchase Option**
- **Region**
- **Service**
- **Tag**
- **Tenancy**
- **Usage Type**
- **Usage Type Group**

You can use Cost Explorer to see which service you use the most, which Availability Zone (AZ) most of your traffic is in, which member account uses AWS the most, and more. You can also apply multiple filters to look at intersecting datasets. For example, you can use the **Linked Account** and **Services** filters to identify the member account that spent the most money on Amazon EC2.

**To filter your data**

1. Open Cost Explorer.
2. For **Filters**, choose a value. After you make a selection, a new control appears with additional options.

3. In the new control, select the items from each list that you want to display in the chart or begin typing in the search box to have Cost Explorer autocomplete your selection. After you choose your filters, choose **Apply filters**.

   **Note**
   Each time that you apply filters to your costs, Cost Explorer creates a new chart. However, you can use your browser’s bookmark feature to save configuration settings (p. 80) for repeated use. Forecasts aren’t saved, and Cost Explorer displays the most recent forecast when you revisit your saved chart.

You can continue refining your cost analysis by using multiple filters, by grouping your data by filter type, and by using the options in the **Advanced Options** tab.

**Combining filters to show data in common**

Cost Explorer displays a chart that represents the data in common to the filters that you have selected, which means that you can use filters together to analyze subsets of cost data. For example, if you set the **Service** filter to show costs related to Amazon EC2 and Amazon RDS services and then select **Reserved** using the **Purchase Option** filter, the cost chart shows how much money **Reserved** instances on Amazon EC2 and Amazon RDS cost for each of the three months specified.

   **Note**
   • AWS Cost and Usage Reports in Cost Explorer is limited to 1024 filters.
   • The RI Utilization reports allow filtering by only one service at a time, and only for the following services:
     • Amazon EC2
     • Amazon Redshift
     • Amazon RDS
     • ElastiCache
     • Amazon ES

**Filters and logical operations (AND/OR)**

When you select multiple filters, and values for each filter, Cost Explorer applies rules that emulate the logical AND and OR operators to your selections. Within each filter, Cost Explorer emulates the logical OR filter to your selection of filter types. In other words, the chart it displays adds the aggregate costs for each item together. Using the previous example, you see bars for both of the selected services, Amazon EC2 and Amazon RDS.

When you select multiple filters, Cost Explorer applies the logical AND operator to your selections. In other words, if you use the **Services** filter and specify Amazon EC2 and Amazon RDS costs for inclusion and then also apply the **Purchase Options** filter to select a single type of purchase option, you see **only** the **Non-Reserved** charges incurred by Amazon EC2 and Amazon RDS.

**Filter and group options**

In Cost Explorer, you can filter by the following groups:

- **API Operation**
  Requests made to and tasks performed by a service, such as write and get requests to Amazon S3.

- **Availability Zone**
Distinct locations within a region that are insulated from failures in other AZs. They provide inexpensive, low-latency network connectivity to other AZs in the same region.

- **Billing Entity**
  
The organization that bills the customer for a service. For AWS service charges, AWS is the billing entity. For third-party services sold through AWS Marketplace, AWS Marketplace is the billing entity.

- **Instance Type**
  
The type of RI that you specified when you launched an Amazon EC2 host, Amazon RDS instance class, Amazon Redshift node, or Amazon ElastiCache node. The instance type determines the hardware of the computer used to host your instance.

- **Legal Entity**
  
The provider of your AWS services. For AWS service charges, AWS is the legal entity. For AWS service charges in India, AISPL is the legal entity.

- **Linked Account**
  
The member accounts in an organization. For more information, see [Consolidated billing for AWS Organizations](p. 155).

- **Platform**
  
The operating system that your RI runs on. Platform is either Linux or Windows.

- **Purchase Option**
  
The method you choose to pay for your Amazon EC2 instances, including Reserved Instances, Spot Instances, Scheduled Reserved Instances, and On-Demand Instances.

- **Region**
  
The geographic areas where AWS hosts your resources.

- **Resources**
  
The unique identifier for your resources.

  **Note**
  
  To enable resource granularity, opt-in through on the Cost Explorer settings page as the management account. This is available for Amazon EC2 instances.

- **Service**
  
AWS products. To learn what's available, see [AWS Products and Services](p. 67). You can use this dimension to filter costs by specific AWS Marketplace software, including your costs for AMIs, web services, and desktop apps. See the [What is AWS Marketplace?](p. 133) guide for more information.

  **Note**
  
  The RI Utilization reports allow filtering by only one service at a time, and only for the following services:
  
  Amazon EC2, Amazon Redshift, Amazon RDS, ElastiCache

- **Tag**
  
Label that you can use to track costs associated with specific areas/entities within your business. For more information about working with tags, see [Applying User-Defined Cost Allocation Tags](p. 133).

- **Tenancy**
  
Specifies if the Amazon EC2 instance is hosted on shared or single-tenant hardware. Some tenancy values include Shared (Default), Dedicated, Host.

- **Usage Type**
Usage types are the units that each service uses to measure the usage of a specific type of resource. For example, the `BoxUsage:t2.micro(Hrs)` usage type filters by the running hours of Amazon EC2 `t2.micro` instances.

**Usage Type Group**

Usage type groups are filters that collect a specific category of usage type filters into one filter. For example, `BoxUsage:c1.medium(Hrs)`, `BoxUsage:m3.xlarge(Hrs)`, and `BoxUsage:t1.micro(Hrs)` are all filters for Amazon EC2 instance running hours, so they are collected into the `EC2: Running Hours` filter.

Usage type groups are available for Amazon EC2, DynamoDB, and Amazon S3. The specific groups available to your account depend on what services you’ve used. The list of groups that might be available includes but isn't limited to the following:

- **DDB: Data Transfer - Internet (In)**
  Filters by costs associated with how many GB are transferred to your DynamoDB databases.

- **DDB: Data Transfer - Internet (Out)**
  Filters by costs associated with how many GB are transferred from your DynamoDB databases.

- **DDB: Indexed Data Storage**
  Filters by costs associated with how many GB that you have stored in DynamoDB.

- **DDB: Provisioned Throughput Capacity - Read**
  Filters by costs associated with how many units of read capacity that your DynamoDB databases used.

- **DDB: Provisioned Throughput Capacity - Write**
  Filters by costs associated with how many units of write capacity that your DynamoDB databases used.

- **EC2: CloudWatch - Alarms**
  Filters by costs associated with how many CloudWatch alarms that you have.

- **EC2: CloudWatch - Metrics**
  Filters by costs associated with how many CloudWatch metrics that you have.

- **EC2: CloudWatch - Requests**
  Filters by costs associated with how many CloudWatch requests that you make.

- **EC2: Data Transfer - CloudFront (Out)**
  Filters by costs associated with how many GB are transferred from your Amazon EC2 instances to a CloudFront distribution.

- **EC2: Data Transfer - CloudFront (In)**
  Filters by costs associated with how many GB are transferred to your Amazon EC2 instances from a CloudFront distribution.

- **EC2: Data Transfer - Inter AZ**
  Filters by costs associated with how many GB are transferred into, out of, or between your Amazon EC2 instances in different AZs.

- **EC2: Data Transfer - Internet (In)**
  Filters by costs associated with how many GB are transferred to your Amazon EC2 instances from outside the AWS network.
• **EC2: Data Transfer - Internet (Out)**

Filters by costs associated with how many GB are transferred from an Amazon EC2 instance to a host outside the AWS network.

• **EC2: Data Transfer - Region to Region (In)**

Filters by costs associated with how many GB are transferred to your Amazon EC2 instances from a different AWS Region.

• **EC2: Data Transfer - Region to Region (Out)**

Filters by costs associated with how many GB are transferred from your Amazon EC2 instances to a different AWS Region.

• **EC2: EBS - I/O Requests**

Filters by costs associated with how many I/O requests that you make to your Amazon EBS volumes.

• **EC2: EBS - Magnetic**

Filters by costs associated with how many GB that you have stored on Amazon EBS Magnetic volumes.

• **EC2: EBS - Provisioned IOPS**

Filters by costs associated with how many IOPS-months that you have provisioned for Amazon EBS.

• **EC2: EBS - SSD(gp2)**

Filters by costs associated with how many GB per month of General Purpose storage that your Amazon EBS volumes use.

• **EC2: EBS - SSD(io1)**

Filters by costs associated with how many GB per month of Provisioned IOPS SSD storage that your Amazon EBS volumes use.

• **EC2: EBS - Snapshots**

Filters by costs associated with how many GB per month that your Amazon EBS snapshots store.

• **EC2: EBS - Optimized**

Filters by costs associated with how many MB per instance hour that your Amazon EBS-optimized instances use.

• **EC2: ELB - Running Hours**

Filters by costs associated with how many hours that your Elastic Load Balancing load balancers ran.

• **EC2: Elastic IP - Additional Address**

Filters by costs associated with how many Elastic IP addresses that you have attached to running Amazon EC2 instances.

• **EC2: Elastic IP - Idle Address**

Filters by costs associated with Elastic IP addresses that you have that are not attached to running Amazon EC2 instances.

• **EC2: NAT Gateway - Data Processed**

Filters by costs associated with how many GB that your network address translation gateways (NAT gateways) processed.

• **EC2: NAT Gateway - Running Hours**

Filters by costs associated with how many hours that your NAT gateways ran.
• **EC2: Running Hours**

Filters by costs associated with how many hours that your Amazon EC2 instances ran.

This **Usage Type Group** contains only the following **Usage Types**:

- AlwaysOnUsage
- BoxUsage
- DedicatedUsage
- HighUsage
- HostBoxUsage
- HostUsage
- ReservedHostUsage
- SchedUsage
- SpotUsage
- UnusedBox

• **ElastiCache: Running Hours**

Filters by costs associated with how many hours that your Amazon ElastiCache nodes ran.

• **ElastiCache: Storage**

Filters by costs associated with how many GB that you have stored in Amazon ElastiCache.

• **RDS: Running Hours**

Filters by costs associated with how many hours that your Amazon RDS databases ran.

This **Usage Type Group** contains only the following **Usage Types**:

- AlwaysOnUsage
- BoxUsage
- DedicatedUsage
- HighUsage
- InstanceUsage
- MirrorUsage
- Multi-AZUsage
- SpotUsage

• **RDS: Data Transfer – CloudFront – In**

Filters by costs associated with how many GB are transferred into Amazon RDS from a CloudFront distribution.

• **RDS: Data Transfer – CloudFront – Out**

Filters by costs associated with how many GB are transferred from a CloudFront distribution to Amazon RDS data transfers.

• **RDS: Data Transfer – Direct Connect Locations – In**

Filters by costs associated with how many GB are transferred into Amazon RDS through a Direct Connect network connection.

• **RDS: Data Transfer – Direct Connect Locations – Out**

Filters by costs associated with how many GB are transferred from Amazon RDS through a Direct Connect network connection.

• **RDS: Data Transfer – InterAZ**
Filters by costs associated with how many GB are transferred into, out of, or between Amazon RDS buckets in different AZs.

- **RDS: Data Transfer – Internet – In**
  Filters by costs associated with how many GB are transferred to your Amazon RDS databases.

- **RDS: Data Transfer – Internet – Out**
  Filters by costs associated with how many GB are transferred from your Amazon RDS databases.

- **RDS: Data Transfer – Region to Region – In**
  Filters by costs associated with how many GB are transferred to your Amazon RDS instances from a different AWS Region.

- **RDS: Data Transfer – Region to Region – Out**
  Filters by costs associated with how many GB are transferred from your Amazon RDS instances to a different AWS Region.

- **RDS: I/O Requests**
  Filters by costs associated with how many I/O requests that you make to your Amazon RDS instance.

- **RDS: Provisioned IOPS**
  Filters by costs associated with how many IOPS-months that you have provisioned for Amazon RDS.

- **RDS: Storage**
  Filters by costs associated with how many GB that you have stored in Amazon RDS.

- **Redshift: DataScanned**
  Filters by costs associated with how many GB that your Amazon Redshift nodes scanned.

- **Redshift: Running Hours**
  Filters by costs associated with how many hours that your Amazon Redshift nodes ran.

- **S3: API Requests - Standard**
  Filters by costs associated with GET and all other standard storage Amazon S3 requests.

- **S3: Data Transfer - CloudFront (In)**
  Filters by costs associated with how many GB are transferred into Amazon S3 from a CloudFront distribution.

- **S3: Data Transfer - CloudFront (Out)**
  Filters by costs associated with how many GB are transferred from a CloudFront distribution to Amazon S3 data transfers, such as how much data was uploaded from your Amazon S3 bucket to your CloudFront distribution.

- **S3: Data Transfer - Inter AZ**
  Filters by costs associated with how many GB are transferred into, out of, or between Amazon S3 buckets in different AZs.

- **S3: Data Transfer - Internet (In)**
  Filters by costs associated with how many GB are transferred to an Amazon S3 bucket from outside the AWS network.

- **S3: Data Transfer - Internet (Out)**
  Filters by costs associated with how many GB are transferred from an Amazon S3 bucket to a host outside the AWS network.
• **S3: Data Transfer - Region to Region (In)**

Filters by costs associated with how many GB are transferred to Amazon S3 from a different AWS Region.

• **S3: Data Transfer - Region to Region (Out)**

Filters by costs associated with how many GB are transferred from Amazon S3 to a different AWS Region.

• **S3: Storage - Standard**

Filters by costs associated with how many GB that you have stored in Amazon S3.

• **Charge Type**

Charge types are different types of charges or fees.

**Credit**

Any AWS credits that are applied to your account.

**Other out-of-cycle charges**

Any subscription charges that aren't upfront reservation charges or support charges.

**Recurring reservation fee**

Any recurring charges to your account. When you purchase a Partial Upfront or No Upfront Reserved Instance from AWS, you pay a recurring charge in exchange for a lower rate for using the instance. The recurring fees can result in spikes on the first day of every month, when AWS charges your account.

**Refund**

Any refunds that you received. Refunds are listed as a separate line item in the data table. They do not appear as an item in the chart because they represent a negative value in the calculation of your costs. The chart displays only positive values.

**Reservation applied usage**

Usage that AWS applied reservation discounts to.

**Support fee**

Any charges that AWS charges you for a support plan. When you purchase a support plan from AWS, you pay a monthly charge in exchange for service support. The monthly fees can result in spikes on the first day of every month, when AWS charges your account.

**Tax**

Any taxes that are associated with the charges or fees in your cost chart. Cost Explorer adds all taxes together as a single component of your costs. If you select five or fewer filters, Cost Explorer displays your tax expenses as a single bar. If you select six or more filters, Cost Explorer displays five bars, stacks, or lines, and then aggregates all remaining items, including taxes, into a sixth bar, stack slice, or plot line that is labeled **Other**.

If you choose to omit **RI upfront fees**, **RI recurring charges**, or **Support charges** from your chart, Cost Explorer continues to include any taxes that are associated with the charges.

Cost Explorer displays your tax costs in the chart only when you choose **Monthly** drop down. When you filter your cost chart, the following rules govern the inclusion of taxes:

1. Taxes are excluded if you select non-**Linked Account** filters, either singly or in combination with other filters.

2. Taxes are included if you select the **Linked Accounts** filters.
**Upfront reservation fee**

Any upfront fees that are charged to your account. When you purchase an All Upfront or Partial Upfront Reserved Instance from AWS, you pay an upfront fee in exchange for a lower rate for using the instance. The upfront fees can result in spikes in the chart for the days or months when you make your purchases.

**Usage**

Usage that AWS didn't apply reservation discounts to.

**Choosing advanced options**

You can customize how you view your data in Cost Explorer using **Advanced Options** to include or exclude specific types of data.

**To exclude data from your chart**


- In the right pane, under **Advanced Options**, under **Include costs related to**, deselect the data type that you want to exclude.

In addition to the costs that Cost Explorer includes, you can show specific costs such as untagged resources or blended costs. This enables you to see the following alternate views of your costs.

**Show only untagged resources**

By default, Cost Explorer includes costs both for resources that have cost allocation tags and for resources that don't have cost allocation tags. To find untagged resources that add to your costs, select **Show only untagged resources**. For more information about cost allocation tags, see Using Cost Allocation Tags (p. 127).

**Show blended costs**

This cost metric reflects the average cost of usage across the consolidated billing family. If you use the consolidated billing feature in AWS Organizations, you can view costs using blended rates. For more information, see Blended Rates (p. 166).

**Show unblended costs**

This cost metric reflects the cost of the usage. When grouped by charge type, unblended costs separate discounts into their own line items. This enables you to view the amount of each discount received.

**Show net unblended costs**

This cost metric reflects the cost after discounts.

**Show amortized costs**

This cost metric reflects the effective cost of the upfront and monthly reservation fees spread across the billing period. By default, Cost Explorer shows the fees for Reserved Instances as a spike on the day that you're charged, but if you choose to show costs as amortized costs, the costs are amortized over the billing period. This means that the costs are broken out into the effective daily rate. AWS estimates your amortized costs by combining your unblended costs with the amortized portion of your upfront and recurring reservation fees. For the daily view, Cost Explorer shows the unused portion of your upfront reservation fees and recurring RI charges on the first of the month.

For example, suppose that Alejandro purchases a Partial Upfront t2.micro RI for a one-year term at $30 dollars upfront, with a monthly fee of $2.48. Cost Explorer shows the costs for this RI as a spike on the first of the month. If Alejandro chooses **Amortized costs** for a 30-day month, the Cost
Explorer chart shows a daily effective rate of $0.165, which is the EC2 effective rate multiplied by
the number of hours in a day.

Amortized costs aren't available for billing periods before 2018. If you want to see how much of your
reservation was unused, group by purchase option.

**Show net amortized costs**

This cost metric amortizes the upfront and monthly reservation fees while including discounts such
as RI volume discounts.

You can show these specific costs by using the following procedure.

**To show specific cost types in your chart**


- In the right pane, under **Advanced Options**, under **Other**, select the cost type that you want to
  show.

**Reading the Cost Explorer data table**

Below each Cost Explorer chart is a data table, which displays the cost figures that the chart represents.
If your chart is using a grouping, the table displays the aggregate amounts for the filter types that you
choose for your chart. If your chart isn't using a grouping, the table displays the aggregate amounts for
your past and forecasted cost data. You can download (p. 81) the .csv file that contains the complete
data set for your chart.

**Note**

For the RI Utilization and Savings report, the maximum table size is 20 rows. If the data exceeds
the maximum table size, it appears in a truncated form.

In the grouped data table, each row is a value for one of the filter type options: API operations,
Availability Zones, AWS services, custom cost allocation tags, instance types, member accounts, purchase
options, Region, usage type, or usage type group. The columns represent time intervals. For example, the
data table shows the account's costs for selected services for the last three months, with an aggregated
total for the three months in the last column.

**Note**

Data transfer costs are included in the services that they’re associated with, such as Amazon EC2
or Amazon S3. They aren't represented as either a separate line item in the data table or a bar in
the chart.

In the ungrouped data table, the row is your costs. The columns represent time intervals.

**Forecasting with Cost Explorer**

You create a forecast by selecting a future time range for your report. For more information, see
Choosing time ranges for the data that you want to view (p. 63). The following section discusses the
accuracy of the forecasts created by Cost Explorer and how to read them.

A forecast is a prediction of how much you will use AWS services over the forecast time period that you
selected, based on your past usage. Forecasting provides an estimate of what your AWS bill will be and
enables you to use alarms and budgets for amounts that you're predicted to use. Because forecasts are
predictions, the forecasted billing amounts are estimated and might differ from your actual charges for
each statement period.

Like weather forecasts, billing forecasts can vary in accuracy. Different ranges of accuracy have different
prediction intervals. The higher the prediction interval, the more likely the forecast will have a wider
range. For example, suppose that you have a budget set to 100 dollars for a given month. An 80% prediction interval might forecast your spend between 90 and 100, with a mean of 95. The range in the prediction band is dependent on your historical spend volatility, or fluctuations. The more consistent and predictable the historical spend, the narrower the prediction range in forecast spend.

Cost Explorer forecasts have a prediction interval of 80%. If AWS doesn't have enough data to forecast an 80% prediction interval, Cost Explorer doesn't provide a forecast. This is common for accounts that have less than one full billing cycle.

Reading forecasts

How you read the Cost Explorer forecasts depends on the type of chart that you're using. Forecasts are available for both line charts and bar charts.

The 80% prediction interval appears differently on each type of chart:

- Line charts represent the prediction interval as a set of lines on either side of your costs line
- Bar charts represent the prediction interval as two lines on either side of the top of your bar

If you receive discounts, we encourage you to use **Show net unblended costs** when forecasting your monthly costs to include discounts. Unblended costs don't include discounts, but instead separates discounts into their own line item. For more information about different costs, see Cost Explorer Advanced Options (p. 73).

Using forecasts with consolidated billing

If you use the consolidated billing feature in AWS Organizations, the forecasts are calculated with the data from all the accounts. If you add a new member account to an organization, forecasts will be less accurate until the new spending patterns of the organization are analyzed. For more information about consolidated billing, see Consolidated billing for AWS Organizations (p. 155).

Using Cost Explorer reports

Cost Explorer provides default reports, but also enables you to change the filters and constraints used to create the reports. Cost Explorer also provides you ways to save the reports that you made. You can save them as a bookmark, download the CSV file, or save them as a report.

**Topics**

- Using the default Cost Explorer reports (p. 75)
- Saving reports and results (p. 80)

Using the default Cost Explorer reports

Cost Explorer provides you with a couple of default reports. You can't modify these reports, but you can use them to create your own custom reports.

- Cost and usage reports (p. 75)
- Reserved Instance reports (p. 76)

Cost and usage reports

Cost Explorer provides you with the following reports for understanding your costs.

- AWS Marketplace (p. 76)
- Daily costs (p. 76)
Using Cost Explorer reports

- Monthly costs by linked account (p. 76)
- Monthly costs by service (p. 76)
- Monthly EC2 running hours costs and usage (p. 76)

AWS Marketplace

The AWS Marketplace report shows how much you have spent through AWS Marketplace.

Daily costs

The Daily costs report shows how much you've spent in the last six months, along with how much you're forecasted to spend over the next month.

Monthly costs by linked account

The Monthly costs by linked account report shows your costs for the last six months, grouped by linked account. The top five linked accounts are shown by themselves, and the rest are grouped into one bar.

Monthly costs by service

The Monthly costs by service report shows your costs for the last six months, grouped by service. The top five services are shown by themselves, and the rest are grouped into one bar.

Monthly EC2 running hours costs and usage

The Monthly EC2 running hours costs and usage report shows how much you have spent on active Reserved Instances (RIs).

Reserved Instance reports

Cost Explorer provides you with the following reports for understanding your reservations.

The reservation reports show your Amazon EC2 coverage and utilization in either hours or normalized units. Normalized units enable you to see your Amazon EC2 usage for multiple sizes of instances in a uniform way. For example, suppose you run an xlarge instance and a 2xlarge instance. If you run both instances for the same amount of time, the 2xlarge instance uses twice as much of your reservation as the xlarge instance, even though both instances show only one instance-hour. Using normalized units instead of instance-hours, the xlarge instance used 8 normalized units, and the 2xlarge instance used 16 normalized units. For more information, see Instance Size Flexibility for EC2 Reserved Instances.

- RI utilization reports (p. 76)
- RI coverage reports (p. 79)

RI utilization reports

The RI Utilization reports show how much of your Amazon EC2, Amazon Redshift, Amazon RDS, Amazon Elasticsearch Service, and Amazon ElastiCache Reserved Instance (RIs) that you use, how much you saved by using RIs, how much you overspent on RIs, and your net savings from purchasing RIs during the selected time range. This helps you to see if you have purchased too many RIs.

The RI Utilization charts display the number of RI hours that your account uses, helping you to understand and monitor your combined usage (utilization) across all of your RIs and services. It also shows how much you saved over On-Demand Instance costs by purchasing a reservation, the amortized costs of your unused reservations, and your total net savings from purchasing reservations. AWS calculates your total net savings by subtracting the costs of your unused reservations from your reservations savings.

The following table shows an example of potential savings (all costs are in USD).
RI utilization example

<table>
<thead>
<tr>
<th>Account</th>
<th>RI utilization</th>
<th>RI hours purchased</th>
<th>RI hours used</th>
<th>RI hours unused</th>
<th>On-Demand cost of RI hours used</th>
<th>Effective RI cost</th>
<th>Net savings</th>
<th>Total potential savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martha</td>
<td>0.50</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td>$200</td>
<td>$150</td>
<td>$50</td>
<td>$250</td>
</tr>
<tr>
<td>Liu Jie</td>
<td>0.75</td>
<td>100</td>
<td>75</td>
<td>25</td>
<td>$300</td>
<td>$150</td>
<td>$150</td>
<td>$250</td>
</tr>
<tr>
<td>Saanvi</td>
<td>1.00</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>$200</td>
<td>$75</td>
<td>$125</td>
<td>$125</td>
</tr>
</tbody>
</table>

As shown in the preceding table, Martha, Liu Jie, and Saanvi purchase RIs at $1.50 an hour and On-Demand hours at $4.00 an hour. Breaking down this example further, you can see how much each of them saves by purchasing RIs:

- Martha purchases 100 RI hours for $150. She uses 50 hours, which would cost $200 if she used On-Demand Instances. She saves $50, which is the cost of 50 On-Demand hours minus the cost of the RI. She could optimize her savings by using more of her purchased RI hours, by converting her RI to cover other instances, or by selling her RIs on the RI Marketplace. For more information about selling an RI on the RI Marketplace, see Selling on the Reserved Instance Marketplace in the Amazon EC2 User Guide for Linux Instances.
- Liu Jie purchases 100 RI hours for $150. He uses 75 of them, which would cost $300 if he used On-Demand Instances. So he saves $150, which is the cost of 300 On-Demand hours minus the cost of the RI.
- Saanvi purchases 50 RI hours for $75. She uses all 50 of them, which would cost $200 if she used On-Demand Instances. So she saves $125, which is the cost of 200 On-Demand hours minus the cost of the RI.

The reports allow you to define a utilization threshold, known as a utilization target, and identify RIs that meet your utilization target and RIs that are underutilized. The chart shows RI utilization as the percentage of purchased RI hours that are used by matching instances, rounded to the nearest percentage.

Target utilization is shown on the chart as a dotted line in the chart and in the table below the chart as a colored RI utilization status bar. RIs with a red status bar are RIs with no hours used. RIs with a yellow status bar are under your utilization target. RIs with a green status bar have met your utilization target. Instances with a gray bar aren’t using reservations. You can change the utilization target in the Display Options section. To remove the utilization target line from the chart, clear the Show target line on chart check box. You can also create budgets that enable AWS to notify you if you fall below your utilization targets. For more information, see Managing your costs with AWS Budgets (p. 95).

You can filter the chart to analyze the purchasing accounts, instance types, and more. RI reports use a combination of RI-specific filters and regular Cost Explorer filters. The RI-specific filters are available only for the Cost Explorer RI Utilization and RI Coverage reports. They aren’t available anywhere else that AWS uses Cost Explorer filters. The following filters are available:

- **Availability Zone** – Filter your RI usage by specific Availability Zones.
- **Instance Type** – Filter your RI usage by specific instance types, such as **t2.micro** or **m3.medium**. This also applies to Amazon RDS instance classes, such as **db.m4**, and Amazon Redshift and ElastiCache node types, such as **dc2.large**.
- **Linked Account** – Filter your reservations by specific member accounts.
- **Platform** – Filter your RI usage by platform, such as **Linux** or **Windows**. This also applies to Amazon RDS database engines.
• **Region** – Filter your RI usage by specific regions, such as **US East (N. Virginia)** or **Asia Pacific (Singapore)**.

• **Scope** (Amazon EC2) – Filter your Amazon EC2 usage to show RIs that are purchased for use in specific Availability Zones or regions.

• **Tenancy** (Amazon EC2) – Filter your Amazon EC2 usage by tenancy, such as **Dedicated** or **Default**. An RI with a **Dedicated** tenancy is reserved for a single tenant, and an RI with a **Default** tenancy might share hardware with another RI.

In addition to changing your utilization target and filtering your RIs, you can choose a single RI or a group of RIs to show in the chart. To choose a single RI or a selection of RIs to see in the chart, select the check box next to the RI in the table below the chart. You can select up to 10 leases at one time.

Cost Explorer shows the combined utilization across all of your RIs in the chart and shows utilization for individual RI reservations in the table below the chart. The table also includes a subset of the information for each RI reservation. You can find the following information for each reservation in the downloadable .csv file:

• **Account Name** – The name of the account that owns the RI reservation.

• **Subscription ID** – The unique subscription ID for the RI reservation.

• **Reservation ID** – The unique ID for the RI reservation.

• **Instance Type** – The RI instance class, instance type, or node type, such as **t2.micro**, **db.m4**, or **dc2.large**.

• **RI Utilization** – The percentage of purchased RI hours that were used by matching instances.

• **RI Hours Purchased** – The number of purchased hours for the RI reservation.

• **RI Hours Used** – The number of purchased hours that were used by matching instances.

• **RI Hours Unused** – The number of purchased hours that weren’t used by matching instances.

• **Account ID** – The unique ID of the account that owns the RI reservation.

• **Start Date** – The date that the RI starts.

• **End Date** – The date that the RI expires.

• **Numbers of RIs** – The numbers of RIs that are associated with the reservation.

• **Scope** – Whether this RI is for a specific Availability Zone or region.

• **Region** – The region that the RI is available in.

• **Availability Zone** – The Availability Zone that the RI is available in.

• **Platform** (Amazon EC2) – The platform that this RI is for.

• **Tenancy** (Amazon EC2) – Whether this RI is for a shared or dedicated instance.

• **Payment Option** – Whether this RI is a Full Upfront, Partial Upfront, or No Upfront RI.

• **Offering Type** – Whether this RI is Convertible or Standard.

• **On-Demand Cost Equivalent** – The cost of the RI hours that you used, based on the public On-Demand prices.

• **Amortized Upfront Fee** – The upfront cost of this reservation, amortized over the RI period.

• **Amortized Recurring Charges** – The monthly cost of this reservation, amortized over the RI period.

• **Effective RI Cost** – The combined amortized upfront and amortized recurring costs of the RI hours that you purchased.

• **Net Savings** – The amount that Cost Explorer estimates that you saved by purchasing reservations.

• **Potential Savings** – The total potential savings that you might see if you use your entire RI.

• **Average On-Demand Rate** – The On-Demand rate of the RI hours that you used. When you view the On-Demand rates for an extended period of time, the On-Demand rate reflects any price changes made during that time period.

If there isn’t any usage for the given time period, the average On-Demand rate shows **N/A**.
• **Total Asset Value** – The effective cost of your reservation term. The total asset value takes both your start date and either your end date or your cancellation date into consideration.

• **Effective Hourly Rate** – The effective hourly rate of your total RI costs. The hourly rate takes both your upfront fees and your recurring fees into consideration.

• **Upfront Fee** – The one-time upfront cost of the RI hours that you purchased.

• **Hourly Recurring Fee** – The effective hourly rate of your monthly RI costs. The hourly recurring fee takes only your recurring fees into consideration.

• **RI Cost For Unused Hours** – The amount that you spent on RI hours that you didn't use.

You can use this information to track how many RI usage hours you used and how many RI hours you reserved but didn't use during the selected time range.

The Daily RI Utilization chart displays your RI utilization for the previous three months on a daily basis. The Monthly RI Utilization chart displays your RI utilization for the previous 12 months on a monthly basis.

**RI coverage reports**

The RI Coverage reports show how many of your Amazon EC2, Amazon Redshift, Amazon RDS, Amazon Elasticsearch Service, and Amazon ElastiCache instance hours are covered by RIs, how much you spent on On-Demand Instances, and how much you might have saved had you purchased more reservations. This enables you to see if you have under-purchased RIs.

The RI coverage charts display the percentage of instance hours that your account used that were covered by reservations, helping you to understand and monitor the combined coverage across all of your RIs. It also shows how much you spent on On-Demand Instances and how much you might have saved had you purchased more reservations.

You can define a threshold for how much coverage you want from RIs, known as a coverage target, which enables you to see where you can reserve more RIs.

Target coverage is shown on the chart as a dotted line, and the average coverage is shown in the table below the chart as a colored status bar. Instances with a red status bar are instances with no RI coverage. Instances with a yellow status bar are under your coverage target. Instances with a green status bar have met your coverage target. Instances with a gray bar aren't using reservations. You can change the coverage target in the **Display Options** section. To remove the coverage target line from the chart, clear the **Show target line on chart** check box. You can also create coverage budgets that enable AWS to notify you if you fall below your coverage target. For more information, see Managing your costs with AWS Budgets (p. 95).

The RI coverage reports use the Cost Explorer filters instead of the RI Utilization filters. You can filter the chart to analyze the purchasing accounts, instance types, and more. RI reports use a combination of RI-specific filters and regular Cost Explorer filters. The RI-specific filters are available only for the Cost Explorer RI Utilization and RI Coverage reports, and aren't available anywhere else that AWS uses Cost Explorer filters. The following filters are available:

• **Availability Zone** – Filter your RI usage by specific Availability Zones.

• **Instance Type** – Filter your RI usage by specific instance types, such as t2.micro or m3.medium. This also applies to Amazon RDS instance classes such as db.m4.

• **Linked Account** – Filter your RI usage by specific linked accounts.

• **Platform** – Filter your RI usage by platform, such as Linux or Windows. This also applies to Amazon RDS database engines.

• **Region** – Filter your RI usage by specific regions, such as US East (N. Virginia) or Asia Pacific (Singapore).

• **Scope (Amazon EC2)** – Filter your Amazon EC2 usage to show RIs that are purchased for use in specific Availability Zones or regions.
• **Tenancy** (Amazon EC2) – Filter your Amazon EC2 usage by tenancy, such as **Dedicated** or **Default**. A **Dedicated** RI is reserved for a single tenant, and a **Default** RI might share hardware with another RI.

In addition to changing your coverage target and filtering your instance types with the available filters, you can choose a single instance type or a group of instance types to show in the chart. To choose a single instance type or a selection of instance types to see in the chart, select the check box next to the instance type in the table below the chart. You can select up to 10 instances at one time.

Cost Explorer shows the combined coverage across all of your instance types in the chart and shows coverage for individual instance types in the table below the chart. The table also includes a subset of the information for each instance type. You can find the following information for each instance type in the downloadable .csv file:

- **Instance Type** (Amazon EC2), **Instance Class** (Amazon RDS), or **Node Type** (Amazon Redshift or Amazon ElastiCache) – The RI instance class, instance type, or node type, such as `t2.micro`, `db.m4`, or `dc2.large`.
- **Database Engine** (Amazon RDS) – Filter your Amazon RDS coverage to show RIs that cover a specific database engine, such as **Amazon Aurora**, **MySQL**, or **Oracle**.
- **Deployment Option** (Amazon RDS) – Filter your Amazon RDS coverage to show RIs that cover a specific deployment option, such as **Multi-AZ** deployments.
- **Region** – The region that the instance ran in, such as `us-east-1`.
- **Platform** (Amazon EC2) – The platform that this RI is for.
- **Tenancy** (Amazon EC2) – Whether this RI is for a shared, dedicated, or host instance.
- **Average Coverage** – The average number of usage hours that a reservation covers.
- **RI Covered Hours** – The number of usage hours that a reservation covers.
- **On-Demand Hours** – The number of usage hours that aren't covered by reservations.
- **On-Demand Cost** – The amount that you spent on On-Demand Instances.
- **Total Running Hours** – The total number of usage hours, both covered and uncovered.

You can use this information to track how many hours you use and how many of those hours are covered by RIs.

The daily chart displays the number of RI hours that your account used on a daily basis for the last three months. The monthly chart displays your RI coverage for the previous 12 months, listed by month.

### Saving reports and results

You can save your Cost Explorer filters and data multiple ways. You can save the exact configuration as a bookmark, you can download the CSV file of the data that Cost Explorer used to create your graphs, or you can save the Cost Explorer configuration as a saved report. Cost Explorer keeps your saved reports and lists them on your report page along with the default Cost Explorer reports.

**Topics**

- Saving your Cost Explorer configuration with bookmarks or favorites (p. 80)
- Downloading the CSV file (p. 81)
- Managing your saved Cost Explorer reports (p. 81)

### Saving your Cost Explorer configuration with bookmarks or favorites

You can save your date, filter, chart style, group by, and advanced settings by saving the Cost Explorer URLs as favorites or bookmarks in your browser. When you return to the link that you saved, Cost Explorer refreshes the page using current cost data for time range you selected and displays the most
recent forecast. This feature enables you to save a configuration that you're likely to refresh and return to often. You can also save a configuration for a specific, unchanging range of time by using the Custom time range and setting fixed start and end dates for your chart.

**Warning**
If you want to save a number of configurations, make sure to give each bookmark or favorite a unique name so that you don't overwrite older configurations when you save a new URL.

### Downloading the CSV file

When you want to review comprehensive detail, you can download a CSV file of the cost data that Cost Explorer uses to generate the chart, which is the same data that appears in the data table under the chart. The data table sometimes does not display the complete data set used for the chart. For more information, see Reading the Cost Explorer data table (p. 74).

**To download a CSV file**

2. Configure Cost Explorer to use the options that you want to see in the CSV file.
3. Choose **Download CSV**.

### Managing your saved Cost Explorer reports

You can save the results of a Cost Explorer query as a Cost Explorer report. This enables you to track your Cost Explorer results and forecasts over time.

**Topics**
- Creating a Cost Explorer report (p. 81)
- Viewing a Cost Explorer report (p. 81)
- Editing a Cost Explorer report (p. 82)
- Deleting a Cost Explorer report (p. 82)

### Creating a Cost Explorer report

You can use the console to save the results of a Cost Explorer query as a report.

**Note**
Cost Explorer reports can be modified. We strongly recommend that you don't use them for auditing purposes.

**To save a Cost Explorer report**

Sign in to the AWS Management Console and open the AWS Cost Management at https://console.aws.amazon.com/cost-management/home.

1. Choose **New report**. This resets all of your Cost Explorer settings to your default settings.
2. For the report name text field, enter a name for your report.
3. Customize your Cost Explorer settings.
4. Choose **Save report**.
5. In the **Save report** dialog box, choose **Continue**.

### Viewing a Cost Explorer report

You can use the console to view saved Cost Explorer reports.
To view your saved reports


1. On the report dropdown menu, choose View/Manage all reports.
2. To return to the Cost Explorer page, choose Back.

Editing a Cost Explorer report

You can use the console to edit Cost Explorer reports.

To edit your report


1. On the report dropdown menu, choose the report that you want to edit.

   Note
   You can’t edit the preconfigured reports. If you choose one of the preconfigured reports as a starting point for a report, enter a new report name in the report name field and continue with this procedure.

2. Customize your Cost Explorer settings.
3. Choose Save report.
4. In the Save report dialog box, choose Continue.

Deleting a Cost Explorer report

You can use the console to delete saved Cost Explorer reports.

To delete a saved report


1. On the report dropdown menu, choose View/Manage all reports.
2. Next to the report that you want to delete, select the check box.
3. On the navigation bar, choose Delete.
4. In the Delete Report dialog box, choose Delete.

Understanding your reservations with Cost Explorer

A significant part of using AWS involves balancing your Reserved Instance (RI) usage and your On-Demand Instance usage. To help with that, Cost Explorer provides a couple of tools to help you understand where your greatest RI costs are and how you can potentially lower your costs. Cost Explorer does this by providing you with an overview of your current reservations, showing your RI utilization and coverage, and calculating recommended RIs that could save you money if you purchase them.

Using your RI reports

You can use the RI reports page in the Cost Explorer console to see how many reservations you have, how much your reservations are saving you compared to similar usage of On-Demand Instances, and how many of your reservations are expiring this month.

Cost Explorer breaks down your reservations and savings by service and lists your potential savings: that is, the costs of On-Demand usage compared to what that usage could cost you with an RI.
To take advantage of your potential savings, see Accessing Reserved Instance Recommendations (p. 83).

Accessing Reserved Instance Recommendations

If you enable Cost Explorer, you automatically get Amazon EC2, Amazon RDS, ElastiCache, Amazon ES, and Amazon Redshift Reserved Instance (RI) purchase recommendations that could help you reduce your costs. RIs provide a discounted hourly rate (up to 75%) compared to On-Demand pricing. Cost Explorer generates your RI recommendations using the following process:

- Identifies your On-Demand Instance usage for a service during a specific time period
- Collects your usage into categories that are eligible for an RI
- Simulates every combination of RIs in each category of usage
- Identifies the best number of each type of RI to purchase to maximize your estimated savings

For example, Cost Explorer automatically aggregates your Amazon EC2 Linux, shared tenancy, and c4 family usage in the US West (Oregon) Region and recommends that you buy size-flexible regional RIs to apply to the c4 family usage. Cost Explorer recommends the smallest size instance in an instance family. This makes it easier to purchase a size-flexible RI. Cost Explorer also shows the equal number of normalized units so that you can purchase any instance size that you want. For this example, your RI recommendation would be for `c4.large` because that is the smallest size instance in the c4 instance family.

Cost Explorer recommendations are based on a single account or organization usage of the past seven, 30, or 60 days. Cost Explorer ignores usage that is already covered by an RI. Amazon EC2, ElastiCache, Amazon ES, and Amazon Redshift recommendations are for RIs scoped to Region, not Availability Zones, and your estimated savings reflects the application of those RIs to your usage. Amazon RDS recommendations are scoped to either Single-AZ or Multi-AZ RIs. Cost Explorer updates your recommendations at least once every 24 hours.

Note

Cost Explorer doesn’t forecast your usage or take forecasts into account when recommending RIs. Instead, Cost Explorer assumes that your historical usage reflects your future usage when determining which RIs to recommend.

Linked accounts can see recommendations only if they have the relevant permissions. Linked accounts need permissions to view Cost Explorer and permissions to view recommendations. For more information, see Viewing the Cost Explorer Reservation Recommendations (p. 84).

Topics

- RI Recommendations for Size-Flexible RIs (p. 83)
- Viewing the Cost Explorer Reservation Recommendations (p. 84)
- Reading the Cost Explorer RI Recommendations (p. 84)
- Modifying Your RI Recommendations (p. 85)
- Saving Your RI Recommendations (p. 86)
- Using Your RI Recommendations (p. 88)

RI Recommendations for Size-Flexible RIs

Cost Explorer also considers the benefits of size-flexible regional RIs when generating your RI purchase recommendations. Size-flexible regional RIs help maximize your estimated savings across eligible instance families in your recommendations. AWS uses the concept of normalized units to compare the various sizes within an instance family. Cost Explorer uses the smallest normalization factor to represent the instance type that it recommends. For more information, see Instance Size Flexibility for EC2 Reserved Instances.
For example, let’s say you own an EC2 RI for a c4.8xlarge. This RI applies to any usage of a Linux/Unix c4 instance with shared tenancy in the same region as the RI, such as the following instances:

- One c4.8xlarge instance
- Two c4.4xlarge instances
- Four c4.2xlarge instances
- Sixteen c4.large instances

It also includes combinations of EC2 usage, such as one c4.4xlarge and eight c4.large instances.

If you own an RI that is smaller than the instance that you’re running, you are charged the prorated, On-Demand price for the excess. This means that you could buy an RI for a c4.4xlarge, use a c4.4xlarge instance most of the time, but occasionally scale up to a c4.8xlarge instance. Some of your c4.8xlarge usage is covered by the purchased RI, and the rest is charged at On-Demand prices. For more information, see How Reserved Instances Are Applied in the Amazon Elastic Compute Cloud User Guide.

Viewing the Cost Explorer Reservation Recommendations

Linked accounts need the following permissions to view recommendations:

- ViewBilling
- ViewAccount

For more information, see Using identity-based policies (IAM policies) for Billing and Cost Management (p. 173).

To view your RI recommendations

   The console opens to the Dashboard, where you can see your current month-to-date usage graphs.
2. In the navigation pane, choose Cost Explorer.
   Under Select a service, choose the service that you want recommendations for. The default recommendation is for RIs with a one-year term and a payment option of Partial Upfront (based on your previous 30 days of usage).

Reading the Cost Explorer RI Recommendations

The RI recommendation page shows you your estimated potential savings, your RI purchase recommendations, and the parameters that Cost Explorer used to create your recommendations. You can change the parameters to get recommendations that might match your use case more closely.

The top of the RI recommendations page show you three numbers:

- **Estimated Annual Savings** – Your Estimated Annual Savings is how much Cost Explorer calculates that you could save by purchasing all the recommended RIs.
- **Savings vs. On-Demand** – Your Savings vs. On-Demand is your estimated savings as a percentage of your current costs.
- **Purchase Recommendations** – Your Purchase Recommendations is how many different RI purchase options that Cost Explorer found for you.
These numbers enable you to see a rough estimate of how much you could potentially save by buying more RIs. You can recalculate these numbers for a different use case by using the parameters in the pane on the right. The pane allows you to change the following parameters:

- **RI term** – The length of the RI reservation that you want recommendations for.
- **Offering class** – Whether you want recommendations for a standard RI or a convertible RI.
- **Payment option** – Whether you want to pay for recommended RIs upfront.
- **Based on the past** – How many days of your previous instance usage that you want your recommendations to take into account.

At the bottom of the page are tabs with some of your savings estimates. The **All accounts** tab enables you to see the recommendations based on the combined usage across your entire organization, and the **Individual accounts** tab enables you to see recommendations that Cost Explorer generated on a per-linked-account basis. The table on each tab shows the different purchase recommendations and details about the recommendations. If you want to see the usage that Cost Explorer based a recommendation on, choose the **View associated usage** link in the recommendation details. This takes you to a report that shows the exact parameters that Cost Explorer used to generate your recommendation. The report also shows your costs and associated usage grouped by **Purchase option**, so that you can view the On-Demand Instance usage that your recommendation is based on.

**Note**
Recommendations that Cost Explorer bases on an individual linked account consider all usage by that linked account, including any RIs used by that linked account. This includes RIs shared by another linked account. The recommendations don't assume that an RI will be shared with the linked account in the future.

You can sort your recommendations by **Monthly estimated savings**, **Upfront RI cost**, **Purchase recommendation**, or **Instance type**.

### Modifying Your RI Recommendations

You can change the information that Cost Explorer uses when it creates your recommendations, and you can also change the types of recommendations that you want. This allows you to see recommendations for the RIs that work best for you, such as All UpFront RIs with a one-year term, based on your last 30 days of usage.

**Note**
Instead of forecasting your future usage, Cost Explorer assumes that your future usage is the same as your previous usage. Cost Explorer also assumes that you are renewing any expiring RIs.

#### To modify your RI recommendations


   The console opens to the **Dashboard**, where you can see your current month-to-date usage graphs.

2. In the navigation pane, choose **Cost Explorer**.

3. On the **Cost Explorer** page, choose **Launch Cost Explorer**.

4. On the navigation bar, choose the menu, choose **RI Recommendations** and then under **Select a service** choose the service that you want to modify the recommendations for.

5. In the **RI Recommendation Parameters** pane, change the parameters that you want to change. Your estimated savings update automatically.

   a. For **RI term**, select the RI term that you want.

   b. For **Offering class**, select the RI class that you want.

   c. For **Payment option**, select the purchase option that you want.

   d. For **Recommendation type**, select the logic that you want your recommendations based on.
e. For Based on the past, select how many days of usage that you want your RI recommendations to be based on.

6. Choose either All accounts or Individual accounts to see recommendations based either on your organization-wide usage or on all of your linked accounts based on their individual account usage.

**Saving Your RI Recommendations**

You can save your RI recommendations as a CSV file.

**To save your RI recommendations**

1. On the Reserved Instance Recommendations page, in the RI parameter pane, change any parameters that you want to change. Your estimated savings update automatically.
2. Above the recommendation table, choose Download CSV.

The CSV file contains the following columns.

**RI Recommendation CSV Columns**

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Service</th>
<th>Column Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average hourly normalized unit usage in Historical Period</td>
<td>EC2, RDS</td>
<td>The average number of normalized units used per hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td>Average hourly usage in Historical Period</td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The average number of instance hours used per hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td>Break Even Months</td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The estimated length of time before you recoup your upfront costs for this set of recommended reservations.</td>
</tr>
<tr>
<td>Cache Engine</td>
<td>ELC</td>
<td>The kind of engine that the recommended ElastiCache reserved node runs, such as Redis or Memcached.</td>
</tr>
<tr>
<td>Database Edition</td>
<td>RDS</td>
<td>The edition of the database engine that the recommended RDS reserved instance runs.</td>
</tr>
<tr>
<td>Database Engine</td>
<td>RDS</td>
<td>The kind of engine that the recommended RDS RI runs, such as Aurora MySQL or MariaDB.</td>
</tr>
<tr>
<td>Deployment Option</td>
<td>RDS</td>
<td>Whether your RI is for an RDS instance in a single Availability Zone or an RDS instance with a backup in another Availability Zone.</td>
</tr>
<tr>
<td>Instance Type</td>
<td>EC2, RDS, ES</td>
<td>The type of instance that the recommendation is generated for (for example, m4.large or t2.nano). For size-flexible recommendations, Cost Explorer aggregates all usage in</td>
</tr>
<tr>
<td>Column Name</td>
<td>Service</td>
<td>Column Explanation</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Column Name</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td>Column Explanation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The region of the instances used to generate a recommendation. You must purchase the recommended RIs in the recommended region to see potential savings.</td>
</tr>
<tr>
<td><strong>Max hourly normalized unit usage in Historical Period</strong></td>
<td>EC2, RDS</td>
<td>The maximum number of normalized units used in an hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td><strong>Max hourly usage in Historical Period</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The maximum number of instance hours used in an hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td><strong>Min hourly normalized unit usage in Historical Period</strong></td>
<td>EC2, RDS</td>
<td>The minimum number of normalized units used in an hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td><strong>Min hourly usage in Historical Period</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The minimum number of instance hours used in an hour over the period chosen for generating recommendations.</td>
</tr>
<tr>
<td><strong>Node Type</strong></td>
<td>ELC, RS</td>
<td>The type of node that the recommendation is generated for, such as ds2.xlarge.</td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>EC2</td>
<td>The operating system and license model for the recommended RI instance type.</td>
</tr>
<tr>
<td><strong>Owner Account</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The account associated with your recommendation.</td>
</tr>
<tr>
<td><strong>Payment Option</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The recommended payment option for the recommendation.</td>
</tr>
<tr>
<td><strong>Projected RI Utilization</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>How much of the recommended RI Cost Explorer estimates you will use.</td>
</tr>
<tr>
<td><strong>Recommendation Date</strong></td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The date that Cost Explorer generated your recommendation.</td>
</tr>
<tr>
<td><strong>Recommended Instance Quantity Purchase</strong></td>
<td>EC2, RDS</td>
<td>How many reservations Cost Explorer recommends that you buy.</td>
</tr>
<tr>
<td><strong>Recommended Normalized Unit Quantity Purchase</strong></td>
<td>EC2, RDS</td>
<td>How many normalized units that Cost Explorer recommends that you buy.</td>
</tr>
</tbody>
</table>
Understanding your reservations with Cost Explorer

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Service</th>
<th>Column Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurring Monthly Cost</td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The recurring monthly cost of the recommended reservations.</td>
</tr>
<tr>
<td>Size Flexible Recommendation</td>
<td>EC2, RDS</td>
<td>Whether a recommended RI is size-flexible.</td>
</tr>
<tr>
<td>Tenancy</td>
<td>EC2</td>
<td>The tenancy for the recommended RI purchase. Valid values are shared or dedicated.</td>
</tr>
<tr>
<td>Term</td>
<td>EC2, RDS, RS, ELC, ES</td>
<td>The recommended term length for the recommendation.</td>
</tr>
</tbody>
</table>

Using Your RI Recommendations

To purchase the recommended reservations, go to the purchase page on a service console. You can also save a CSV file of your recommendations and purchase the reservations at a later date.

To use Amazon Elastic Compute Cloud recommendations

1. On the Reserved Instance Recommendations page, choose Amazon EC2 RI Purchase Console to go to the Amazon EC2 Purchase Console.
2. Purchase your RIs by following the instructions at Buying Reserved Instances in the Amazon EC2 User Guide for Linux Instances.

To use Amazon Relational Database Service recommendations

1. On the Reserved Instances page in the Amazon RDS console, choose Purchase Reserved DB Instance.
2. Purchase your reservations by following the instructions at Working with Reserved DB Instances in the Amazon RDS User Guide.

To use Amazon Redshift recommendations

1. On the Reserved Node page in the Amazon Redshift console, choose Purchase Reserved Nodes.
2. Purchase your reservations by following the instructions at Purchasing a Reserved Node Offering with the Amazon Redshift Console in the Amazon Redshift Cluster Management Guide.

To use Amazon Elasticsearch Service recommendations

1. On the Reserved Instances page in the Amazon ES console, choose Purchase Reserved Instance.
2. Purchase your reservations by following the instructions at Amazon Elasticsearch Service Reserved Instances in the Amazon Elasticsearch Service Developer Guide.

To use Amazon ElastiCache recommendations

2. Purchase your reservations by following the instructions at Purchasing a Reserved Node in the Amazon ElastiCache User Guide.
Managing your reservation expiration alerts

You can track your reservations and their expiration in Cost Explorer. Reservation expiration alerts enable you to receive email alerts 7, 30, or 60 days in advance before your reservation expiration date. These notifications also alert you on the date of expiration and can be sent to up to 10 email recipients. Reservation expiration alerts are supported for Amazon EC2, Amazon RDS, Amazon Redshift, Amazon ElastiCache, and Amazon Elasticsearch Service reservations.

To turn on reservation expiration alerts

2. On the navigation pane, choose Cost Explorer.
3. Navigate to the Reservation summary page.
4. In the Reservation expiring section, choose Manage alerts in the upper right corner.
5. Select the check boxes for when you want to receive your alerts.
6. Enter email addresses for who you want to notify. You can add up to 10 emails.
7. Choose Save.

AWS begins monitoring your reservation portfolio and automatically sends alerts at your preference.

Optimizing your cost with Rightsizing Recommendations

The rightsizing recommendations feature in Cost Explorer helps you identify cost-saving opportunities by downsizing or terminating instances in Amazon Elastic Compute Cloud (Amazon EC2). Rightsizing recommendations analyze your Amazon EC2 resources and usage to show opportunities for how you can lower your spending. You can see all of your underutilized Amazon EC2 instances across member accounts in a single view to immediately identify how much you can save. After you identify your recommendations, you can take action on the Amazon EC2 console.

Topics
- Getting started with rightsizing recommendations (p. 89)
- Using your rightsizing recommendations (p. 90)
- CSV details (p. 91)
- Understanding your rightsizing recommendations calculations (p. 92)

Getting started with rightsizing recommendations

You can access your reservation recommendations and resource-based recommendations on the Cost Explorer console. After you enable the feature, it can take up to 30 hours to generate your recommendations.

To access rightsizing recommendations

2. In the navigation pane, choose Cost Explorer.
4. In the navigation pane, choose **Recommendations**.

**To enable rightsizing recommendations**

1. Choose **Launch Cost Explorer**.
2. In the navigation pane, choose **Recommendations**.
3. In the **Resource optimization recommendations** section, choose **Enable rightsizing recommendations**.

**Note**

Only regular or a management account can enable rightsizing recommendations. After you enable the feature, both member and management account can access rightsizing recommendations unless the management account specifically prohibits member account access on the settings page.

To improve the recommendation quality, AWS might use your published utilization metrics, such as disk or memory utilization, to improve our recommendation models and algorithms. All metrics are anonymized and aggregated before AWS uses them for model training. If you want to opt out of this experience and request that your metrics not be stored and used for model improvement, contact AWS Support. For more information, see [AWS Service Terms](#).

**Using your rightsizing recommendations**

You can see the following top-level key performance indicators (KPIs) in your rightsizing recommendations:

- **Optimization opportunities** – The number of recommendations available based on your resources and usage
- **Estimated monthly savings** – The sum of the projected monthly savings associated with each of the recommendations provided
- **Estimated savings (%)** – The available savings relative to the direct instance costs (On-Demand) associated with the instances in the recommendation list

**To filter your rightsizing recommendations**

1. Choose **Launch Cost Explorer**.
2. In the left navigation pane, choose **Recommendations**.
3. In the **Resource optimization recommendations** section, choose **Enable rightsizing recommendations**.
4. At the top of the **Rightsizing Recommendations** page, filter your recommendations by selecting any or all of the following check boxes:
   - Idle instances (termination recommendations)
   - Underutilized instances
   - Include Savings Plans and Reserved Instances (option to consider existing Savings Plans or RI coverage in recommendation savings calculations)
   - Generate recommendations (option to generate recommendations within the instance family, or across multiple instance families)
5. Above the **Findings** table, use the search bar to filter by the following parameters:
   - Account ID (option available from the management account)
   - Region
   - Cost allocation tag
To view your rightsizing recommendations details

1. Choose Launch Cost Explorer.
2. In the left navigation pane, choose Recommendations.
3. Choose View.

The View button on the right of each recommendation opens a window that provides details on the instances and recommended actions.

To download your recommendations in CSV format

1. Choose Launch Cost Explorer.
2. In the left navigation pane, choose Recommendations.
3. Select Download CSV.

For definitions for the CSV file fields, see CSV details (p. 91).

Enhancing your recommendations using CloudWatch metrics

We can examine your memory utilization if you enable your Amazon CloudWatch agent.

To enable memory utilization, see Installing the CloudWatch Agent.

Important

When you create a CloudWatch configuration file, use the default namespace and default names for the collected metrics.

For InstanceID, choose append_Dimension. Do not add additional dimensions for individual memory or disk metrics. Disk utilization is currently not examined.

For Linux instances, choose mem_used_percent as your metric for your CloudWatch agent to collect. For Windows instances, choose "% Committed Bytes In Use".

For more information about the CloudWatch agent, see Collecting Metrics and Logs from Amazon EC2 Instances and On-Premises Servers with the CloudWatch Agent in the Amazon CloudWatch User Guide.

CSV details

The following is a list of fields in the downloadable CSV form from the Rightsizing Recommendations page. The fields are repeated if there are multiple rightsizing options available. The file also contains all of your relevant cost allocation tags.

- **Account ID** – The AWS account ID that owns the instance that the recommendation is based off of.
- **Account Name** – The name of the account that owns the instance that the recommendation is based off of.
- **Instance ID** – The unique instance identifier.
- **Instance Name** – The name you’ve given to the instance.
- **Instance Type** – The instance family and size of the original instance.
- **Instance Name** – The name you’ve given an instance. This field will show as blank if you haven’t given the instance a name.
- **OS** – The operating system or platform of the current instance.
- **Region** – The AWS Region that the instance is running in.
- **Running Hours** – The total number of running hours of the instance over the last 14 days.
- **RI Hours** – The subset of the total running hours that are covered by an AWS reservation over the look-back period.
- **OD Hours** – The subset of the total running hours that are On-Demand over the look-back period.
• **SP Hours** – The subset of the total running hours that are covered by Savings Plans over the look-back period.

• **CPU Utilization** – The maximum CPU utilization of the instance over the look-back period.

• **Memory Utilization** – The maximum memory utilization of the instance over the look-back period (if available from the Amazon CloudWatch agent).

• **Disk Utilization** – The maximum disk utilization of the instance over the look-back period (if available from the CloudWatch agent - currently not supported).

• **Network Capacity** – The maximum network input/output operations per second capacity of the current instance. This isn’t a measure of actual instance use or performance, only capacity. It’s not considered in the recommendation.

• **EBS Read Throughput** – The maximum number of read operations per second.

• **EBS Write Throughput** – The maximum number of write operations per second.

• **EBS Read Bandwidth** – The maximum volume of read KiB per second.

• **EBS Write Bandwidth** – The maximum volume of write KiB per second.

• **Recommended Action** – The recommended action, either modify or terminate the instance.

• **Recommended Instance Type 1** – The instance family and size of the recommended instance type. For termination recommendations, this field is empty.

• **Recommended Instance Type 1 Estimated Saving** – The projected savings based on the recommended action, instance type, associated rates, and your current Reserved Instance (RI) portfolio.

• **Recommended Instance Type 1 Projected CPU** – The projected value of the CPU utilization based on utilization of current instance disk and recommended instance specifications.

• **Recommended Instance Type 1 Projected Memory** – The projected value of the memory utilization based on utilization of current instance memory and recommended instance specifications.

• **Recommended Instance Type 1 Projected Disk** – The projected value of the disk utilization based on utilization of current instance disk and recommended instance specifications.

• **Recommended Instance Type 1 Network Capacity** – The maximum network input/output operations per second capacity of the recommended instance. This isn't a measure of actual instance use or performance, only capacity. It's not considered in the recommendation.

### Understanding your rightsizing recommendations calculations

This section provides an overview of the savings calculations that are used in your rightsizing recommendations algorithms.

**Consolidated billing family**

To identify all instances for all accounts in the consolidated billing family, rightsizing recommendations look at the usage for the last 14 days for each account. If the instance was stopped or terminated, we remove it from consideration. For all remaining instances, we call CloudWatch to get maximum CPU utilization data, memory utilization (if enabled), network in/out, local disk input/ output (I/O), and performance of attached EBS volumes for the last 14 days. This is to produce conservative recommendations, not to recommend instance modifications that could be detrimental to application performance or that could unexpectedly impact your performance.

**Determining if an instance is idle, underutilized, or neither**

We look at the maximum CPU utilization of the instance for the last 14 days to make one of the following assessments:

• **Idle** – If the maximum CPU utilization is at or below 1%. A termination recommendation is generated, and savings are calculated. For more information, see Savings calculation (p. 93).
• **Underutilized** – If the maximum CPU utilization is above 1% and cost savings are available in modifying the instance type, a modification recommendation is generated.

If the instance isn't idle or underutilized, we don't generate any recommendations.

**Generating modification recommendations**

Recommendations use a machine learning engine to identify the optimal Amazon EC2 instance types for a particular workload. Instance types include those that are a part of AWS Auto Scaling groups.

The recommendations engine analyzes the configuration and resource usage of a workload to identify dozens of defining characteristics. For example, it can determine whether a workload is CPU-intensive or whether it exhibits a daily pattern. The recommendations engine analyzes these characteristics and identifies the hardware resources that the workload requires.

Finally, it concludes how the workload would perform on various Amazon EC2 instances to make recommendations for the optimal AWS compute resources that the specific workload.

**Savings calculation**

We first examine the instance running in the last 14 days to identify whether it was partially or fully covered by an RI or Savings Plans, or running On-Demand. Another factor is whether the RI is size-flexible. The cost to run the instance is calculated based on the On-Demand hours and the rate of the instance type.

For each recommendation, we calculate the cost to operate a new instance. We assume that a size-flexible RI covers the new instance in the same way as the previous instance if the new instance is within the same instance family. Estimated savings are calculated based on the number of On-Demand running hours and the difference in On-Demand rates. If the RI isn't size-flexible, or if the new instance is in a different instance family, the estimated savings calculation is based on whether the new instance had been running during the last 14 days as On-Demand.

Cost Explorer only provides recommendations with an estimated savings greater than or equal to $0. These recommendations are a subset of Compute Optimizer results. For more performance-based recommendations that might result in a cost increase, see Compute Optimizer.

You can choose to view saving with or without consideration for RI or Savings Plans discounts. Recommendations consider both discounts by default. Considering RI or Savings Plans discounts might result in some recommendations showing a savings value of $0. To change this option, see Using your rightsizing recommendations (p. 90).

**Note**

Rightsizing recommendations doesn't capture second-order effects of rightsizing, such as the resulting RI hour's availability and how they will apply to other instances. Potential savings based on reallocation of the RI hours aren't included in the calculation.

**Using the AWS Cost Explorer API**

The Cost Explorer API allows you to programatically query your cost and usage data. You can query for aggregated data such as total monthly costs or total daily usage. You can also query for granular data, such as the number of daily write operations for DynamoDB database tables in your production environment.

If you use a programming language that AWS provides an SDK for, we recommend that you use the SDK. All the AWS SDKs greatly simplify the process of signing requests and save you a significant amount of time when compared with using the AWS Cost Explorer API. In addition, the SDKs integrate easily with your development environment and provide easy access to related commands.
For more information about available SDKs, see Tools for Amazon Web Services. For more information about the AWS Cost Explorer API, see the AWS Billing and Cost Management API Reference.

Service endpoint

Service Endpoint

The Cost Explorer API provides the following endpoint:

- https://ce.us-east-1.amazonaws.com

Granting IAM permissions to use the AWS Cost Explorer API

An IAM user must be granted explicit permission to query the AWS Cost Explorer API. For the policy that grants the necessary permissions to an IAM user, see View costs and usage (p. 187).

Best practices for the AWS Cost Explorer API

The following are best practices when working with the Cost Explorer API.

Topics

- Best practices for configuring access to the Cost Explorer API (p. 94)
- Best practices for querying the Cost Explorer API (p. 94)
- Best practices for optimizing your Cost Explorer API costs (p. 94)

Best practices for configuring access to the Cost Explorer API

An IAM user must be granted explicit permission to query the Cost Explorer API. Granting an IAM user access to the Cost Explorer API gives that user query access to any cost and usage data available to that account. For the policy that grants the necessary permissions to an IAM user, see View costs and usage (p. 187).

When configuring access to the Cost Explorer API, we recommend creating a unique IAM user for allowing programmatic access. If you want to give multiple IAM users query access to the Cost Explorer API, we recommend creating a programmatic access IAM role for each of them.

Best practices for querying the Cost Explorer API

When querying the Cost Explorer API, we recommend using filtering conditions to refine your queries so that you receive only the data that you need. You can do this by restricting the time range to a smaller interval or by using filters to limit the result set that your request returns. This enables your queries to return data more quickly than if you're accessing a larger set of data.

Adding one or more grouping dimensions to your query can increase the size of your result and can impact query performance. Depending on your use case, it can make sense to filter your data instead.

The Cost Explorer API can access up to 12 months of historical data and data for the current month. It can also provide 3 months of cost forecast data at the daily level of granularity and 12 months of cost forecast data at the monthly level of granularity.

Best practices for optimizing your Cost Explorer API costs

Because you're charged for the Cost Explorer API per paginated request, we recommend identifying the exact dataset to access before submitting queries.
AWS billing information is updated up to three times daily. Typical workloads and use cases for the Cost Explorer API anticipate a call pattern cadence ranging from daily to several times per day. To receive the most up-to-date data available, query for the time period that you're interested in.

If you’re creating an application using the Cost Explorer API, we recommend architecting the application so that it has a caching layer. This enables you to regularly update the underlying data for your end users, but doesn’t trigger queries every time that an individual in your organization accesses it.

Managing your costs with AWS Budgets

You can use AWS Budgets to track and take action on your AWS cost and usage. You can use AWS Budgets to monitor your aggregate utilization and coverage metrics for your Reserved Instances (RIs) or Savings Plans. If you’re new to AWS Budgets, see Best practices for AWS Budgets (p. 96).

You can use AWS Budgets to enable simple-to-complex cost and usage tracking. Some examples include:

- Setting a monthly cost budget with a fixed target amount to track all costs associated with your account. You can choose to be alerted for both actual (after accruing) and forecasted (before accruing) spends.
- Setting a monthly cost budget with a variable target amount, with each subsequent month growing the budget target by 5 percent each month. Then, you can configure your notifications for 80 percent of your budgeted amount and apply an action. For example, you could automatically apply a custom IAM policy that denies you the ability to provision additional resources within an account.
- Setting a monthly usage budget with a fixed usage amount and forecasted notifications to help ensure that you are staying within the service limits for a specific service. You can also be sure you are staying under a specific AWS Free Tier offering.
- Setting a daily utilization or coverage budget to track your RI or Savings Plans. You can choose to be notified through email and Amazon SNS topics when your utilization drops below 80 percent for a given day.

AWS Budgets information is updated up to three times a day. Updates typically occur 8–12 hours after the previous update. Budgets can track your unblended costs, amortized, and blended costs. Budgets can include or exclude charges such as descriptions, refunds, support fees, and taxes.

You can create the following types of budgets:

- **Cost budgets** – Plan how much you want to spend on a service.
- **Usage budgets** – Plan how much you want to use one or more services.
- **RI utilization budgets** – Define a utilization threshold and receive alerts when your RI usage falls below that threshold. This lets you see if your RIs are unused or under-utilized.
- **RI coverage budgets** – Define a coverage threshold and receive alerts when the number of your instance hours that are covered by RIs fall below that threshold. This lets you see how much of your instance usage is covered by a reservation.
- **Savings Plans utilization budgets** – Define a utilization threshold and receive alerts when the usage of your Savings Plans falls below that threshold. This lets you see if your Savings Plans are unused or under-utilized.
- **Savings Plans coverage budgets** – Define a coverage threshold and receive alerts when your Savings Plans eligible usage that is covered by Savings Plans fall below that threshold. This lets you see how much of your instance usage is covered by Savings Plans.

You can set up optional notifications that warn you if you exceed, or are forecasted to exceed, your budgeted amount for cost or usage budgets or fall below your target utilization and coverage for RI or
Savings Plans budgets. You can have notifications sent to an Amazon SNS topic, to an email address, or to both. For more information, see Creating an Amazon SNS topic for budget notifications (p. 112).

If you use consolidated billing in an organization and you own the management account, you can use IAM policies to control access to budgets by member accounts. By default, owners of member accounts can create their own budgets but can’t create or edit budgets for other users. You can create IAM users with permissions that allow them to create, edit, delete, or read budgets in a specific account. However, we do not support cross-account usage.

A budget is only visible to users with access to the account that created the budget, and with access to the budget itself. For example, a management account can create a budget that tracks a specific member account's cost, but the member account can only view the same budget if they receive access to the management account. For more information, see Overview of managing access permissions (p. 172). For more information about AWS Organizations, see the AWS Organizations User Guide.

Note
There can be a delay between when you incur a charge and when you receive a notification from AWS Budgets for the charge. This is due to a delay between when an AWS resource is used and when that resource usage is billed. You might incur additional costs or usage that exceed your budget notification threshold before AWS Budgets can notify you.

Topics
- Best practices for AWS Budgets (p. 96)
- Creating a budget (p. 98)
- Viewing your budgets (p. 107)
- Editing a budget (p. 108)
- Downloading a budget (p. 108)
- Copying a budget (p. 109)
- Deleting a budget (p. 109)
- Configuring AWS Budgets controls (p. 109)
- Creating an Amazon SNS topic for budget notifications (p. 112)
- Receiving budget alerts in Amazon Chime and slack (p. 114)

Best practices for AWS Budgets

Note the following best practices when you're working with budgets.

Topics
- Best practices for controlling access to AWS Budgets (p. 96)
- Best practices for budget actions (p. 97)
- Best practices for setting budgets (p. 97)
- Best practices for using the advanced options when setting cost budgets (p. 97)
- Understanding the AWS Budgets update frequency (p. 97)
- Best practices for setting budget alerts (p. 98)
- Best practices for setting budget alerts using Amazon SNS topics (p. 98)

Best practices for controlling access to AWS Budgets

To allow IAM users to create budgets in the AWS Billing and Cost Management console, you must also allow IAM users to do the following:

- View your billing information
• Create Amazon CloudWatch alarms
• Create Amazon Simple Notification Service (Amazon SNS) notifications

To learn more about giving users the ability to create budgets on the AWS Budgets console, see Allow IAM users to create budgets (p. 185).

You can also create budgets programmatically using the Budgets API. When configuring access to the Budgets API, we recommend creating a unique IAM user for allowing programmatic access. This helps you define more precise access controls between who in your organization has access to the AWS Budgets console and the API. To give multiple IAM users query access to the Budgets API, we recommend creating a programmatic access IAM role for each of them.

Best practices for budget actions

Using managed policies

There are two AWS managed policies to help get you started with budget actions. One for the user, and the other for budgets. These policies are related. The first policy ensures a user can pass a role to the budgets service, and the second allows budgets to execute the action.

If you don't have proper permissions configured and assigned for the user and for AWS Budgets, AWS Budgets can't execute your configured actions. To ensure proper configuration and execution, we've configured these managed policies so your AWS Budgets actions work as intended. We recommend you use these IAM policies to be sure you don't have to update your existing IAM policy for AWS Budgets when a new functionality is included. We will add new capabilities to the managed policy by default.

For details about managed policies, see Managed policies (p. 179).

To learn more about AWS Budgets actions, see the Configuring AWS Budgets controls (p. 109) section.

Using Amazon EC2 Auto Scaling

If a budget action is used to stop an Amazon EC2 instance in an Auto Scaling group, Amazon EC2 Auto Scaling restarts the instance, or launches new instances to replace the stopped instance. Therefore, budget actions is not effective to control cost in this use case.

Best practices for setting budgets

Use AWS Budgets to set custom budgets based on your costs, usage, reservation utilization, and reservation coverage.

With AWS Budgets, you can set budgets on a recurring basis or for a specific time frame. However, we recommend setting your budget on a recurring basis so that you don't unexpectedly stop receiving budget alerts.

Best practices for using the advanced options when setting cost budgets

Cost budgets can be aggregated by unblended costs, amortized costs, or blended costs. Cost budgets can also either include or exclude refunds, credits, upfront reservation fees, recurring reservation charges, non-reservation subscription costs, taxes, and support charges.

Understanding the AWS Budgets update frequency

AWS billing data, which Budgets uses to monitor resources, is updated at least once per day. Keep in mind that budget information and associated alerts are updated and sent according to this data refresh cadence.
Best practices for setting budget alerts

Budget alerts can be sent to up to 10 email addresses and one Amazon SNS topic per alert. You can set budgets to alert against either actual values or forecasted values.

Actual alerts are only sent out once per budget, per budget period, when a budget first reached the actual alert threshold.

Forecast-based budget alerts are sent out on a per-budget, per-budget period basis. They might alert more than once in a budgeted period if the forecasted values exceed, dip below, and then exceed the alert threshold again during the budgeted period.

AWS requires approximately 5 weeks of usage data to generate budget forecasts. If you set a budget to alert based on a forecasted amount, this budget alert isn't triggered until you have enough historical usage information.

Best practices for setting budget alerts using Amazon SNS topics

When you create a budget that sends notifications to an Amazon SNS topic, you must either have a preexisting Amazon SNS topic or create an Amazon SNS topic. Amazon SNS topics enable you to send notifications over SMS in addition to email.

For budget notifications to be sent successfully, your budget must have permissions to send a notification to your topic, and you must accept the subscription to the Amazon SNS notification topic. For more information, see Creating an Amazon SNS topic for budget notifications (p. 112).

Creating a budget

You can create budgets to track and take action on your costs and usage. You can also create budgets to track your aggregate Reserved Instance (RI) and Savings Plans utilization and coverage. By default, single accounts, the management account, and member accounts in an AWS Organizations organization can create budgets.

- Creating a cost budget (p. 98)
- Creating a usage budget (p. 101)
- Creating a reservation budget (p. 103)
- Creating a Savings Plans budget (p. 104)

When you create a budget, AWS Budgets provides a Cost Explorer graph to help you see your incurred costs and usage. If you haven't used Cost Explorer, then this graph is blank and AWS Budgets enables Cost Explorer when you start to create your first budget. You can create your budget without enabling Cost Explorer. It can take up to 24 hours for this graph to appear after you or AWS Budgets enable Cost Explorer.

Creating a cost budget

Use this procedure to create a cost-based budget.

To create a cost budget

2. In the navigation pane, choose Budgets.
3. At the top of the page, choose Create budget.
Creating a budget

4. For **Select budget type**, choose **Cost budget**.

5. Choose **Set up your budget**.

6. For **Name**, enter the name of your budget. Your budget name must be unique within your account and can use A-Z, a-z, spaces, and the following characters:

   _.:/=+-%@

7. For **Period**, choose how often you want the budget to reset the actual and forecasted spend. Choose **Daily** for every day, **Monthly** for every month, **Quarterly** for every three months, and **Annually** for every year. You can also set custom future budgeted amounts for **Monthly** and **Quarterly** by using the Budget Planning feature.

8. For a fixed **Budgeted Amount**, enter the total amount that you want to spend for this budget period. For **Monthly** and **Quarterly** Planning budgets, enter the amount you want to spend for each planned period.

   **Note**
   After all of the **Budgeted Amounts** values in Planned Budget are used, the budget continues to use the last limit as the **Budgeted Amount**. At that point, the planned budget provides the same experience as a fixed budget.

9. (Optional) For **Budget effective dates**, choose **Recurring Budget** for a budget that resets after the budget period or **Expiring Budget** for a one-time budget that doesn't reset after the budget period. The start and end effective dates depend on your selected period.

   - If your budget period is **Daily**: Choose the **Start Date** to begin tracking against your budgeted amount. For an **Expiring Budget** for **End Date**, choose the date for the budget to end on.
   - If your budget period is **Monthly**: Choose the **Start Month** to begin tracking against your budgeted amount. For an **Expiring Budget**, for **End Month**, choose the month that you want the budget to end on.

   All budget times are in UTC.

10. (Optional) Under **Budget parameters (optional)**, for **Filtering**, choose one or more of the available filters (p. 106). Your choice of budget type determines the set of filters that is displayed on the console.

   **Note**
   You can't use the linked account filter within a linked account.

11. (Optional) Under **Budget parameters (optional)**, for **Advanced options**, choose one or more of the following filters. If you are signed in from a member account in an organization instead of from a management account, you might not see all of the advanced options.

   **Refunds**
   Any refunds that you received.

   **Credits**
   Any AWS credits that are applied to your account.

   **Upfront reservation fees**
   Any upfront fees that are charged to your account. When you purchase an All Upfront or Partial Upfront Reserved Instance from AWS, you pay an upfront fee in exchange for a lower rate for using the instance.

   **Recurring reservation charges**
   Any recurring charges to your account. When you purchase a Partial Upfront or No Upfront Reserved Instance from AWS, you pay a recurring charge in exchange for a lower rate for using the instance.
Taxes

Any taxes that are associated with the charges or fees in your budget.

Support charges

Any charges that AWS charges you for a support plan. When you purchase a support plan from AWS, you pay a monthly charge in exchange for service support.

Other subscription costs

Other applicable subscription costs that are not covered by the other data categories. These costs can include data such as AWS training fees, AWS competency fees, out-of-cycle charges such as registering a domain with Route 53, and more.

Use blended costs

The cost of the instance hours that you used. A blended rate doesn't include either the RI upfront costs or the RI discounted hourly rate.

Use amortized costs

The amortized cost of any reservation hours that you used. For more information about amortized costs, see Show amortized costs.

Discounts

Any enterprise discount such as RI volume discounts. Discount line items do not contain tags.

12. Choose Configure alerts.

13. Under Configure alerts, for Alert 1, choose Actual to create a notification for actual spend and Forecast to create a notification for your forecasted spend.

   The Forecast option is not available for Daily Budgets because the daily budgeted amount is always evaluated against the day before.

14. For Alert threshold, enter the amount that you want to be notified at. This can be either an absolute value or a percentage. For example, for a budget of 200 dollars, if you want to be notified at 160 dollars (80% of your budget), enter 160 for an absolute budget or 80 for a percentage budget.

   Next to the amount, choose Absolute amount to be notified when the threshold amount is passed and % of budgeted amount to be notified when the threshold percentage of the budget is passed.

15. (Optional) For Email contacts, enter the email addresses that you want the notifications to be sent to and choose Add email contact. Separate multiple email addresses with a comma. A notification can have up to 10 email addresses.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

16. (Optional) For SNS topic ARN, enter the ARN for your Amazon SNS topic and then choose Verify. If you want to use an Amazon SNS topic for your notification but don't have one, see Create a Topic in the Amazon Simple Notification Service Developer Guide.

   AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the Verify step fails, check the Amazon SNS topic policy to make sure that it allows your budget to publish to that topic.

   For a sample policy and instructions on granting your budget permissions, see Creating an Amazon SNS topic for budget notifications (p. 112). A notification can be subscribed to only one Amazon SNS topic.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.
17. (Optional) Choose Add a budget action.
   a. Configure your notification settings for your action. This defaults to the same notification settings created in Creating an Amazon SNS topic for budget notifications (p. 112).
   b. In the Choose your budget action section, choose an IAM role to allow AWS Budgets to perform an action on your behalf. If you don’t have the proper permissions assigned, AWS Budgets can’t run your configured actions.

   For more information and examples for IAM role permissions, see Allow AWS Budgets to apply IAM policies and SCPs and target EC2 and RDS instances (p. 192).
   c. Choose the action type you want AWS Budgets to apply on your behalf.

   You can choose from applying an IAM policy, a service control policy (SCP), or targeting specific Amazon EC2 or Amazon RDS instances. You can apply multiple budget actions to a single threshold. Only a management account can apply SCPs.
   d. Choose whether you want to run these actions automatically or through a workflow approval process. The workflow approval is set as your default experience.

18. Choose Confirm budget.
19. Review your budget settings, and choose Create.

Important
When you finish creating a budget with Amazon SNS notifications, Amazon SNS sends a confirmation email to the email addresses that you specify. The subject line is AWS Notification - Subscription Confirmation. A recipient must choose Confirm subscription in the confirmation email to begin receiving notifications.

Creating a usage budget

Use this procedure to create a usage-based budget.

To create a usage budget

2. In the navigation pane, choose Budgets.
3. At the top of the page, choose Create budget.
4. For Select budget type, choose Usage budget.
5. Choose Set up your budget.
6. For Name, enter the name of your budget. Your budget name must be unique within your account and can use A-Z, a-z, spaces, and the following characters: _ . : / = + % @

7. For Period, choose how often you want the budget to reset the actual and forecasted usage. Choose Daily for every day, Monthly for every month, Quarterly for every three months, or Annually for every year. You can also set custom future budgeted amounts for Monthly and Quarterly by using the Budget Planning feature.
8. Under Usage unit(s), choose either Usage Type Group or Usage Type. A usage type group is a collection of usage types that have the same unit of measure, such as resources that measure usage by the hour.
   a. For Usage Type Group, choose the unit of measurement that you want the budget to use.
   b. For Usage Type, choose the service that you want to include in the budget and then choose the unit of measurement that you want the budget to use.
For a fixed **Budgeted Amount**, enter the total number of units that you want to use for this budget period. For **Monthly** and **Quarterly** planning budgets, enter the amount you want to spend for each planned period.

**Note**
After all of the **Budgeted Amounts** values in Planned Budget are used, the budget continues to use the last limit as the **Budgeted Amount**. At that point, the planned budget provides the same experience as a fixed budget.

10. (Optional) For **Budget effective dates**, choose **Recurring Budget** for a budget that resets after the budget period or **Expiring Budget** for a one-time budget that doesn’t reset after the budget period.

The start and end effective dates depend on your selected period.

- If your budget period is **Daily**: Choose the **Start Date** to begin tracking against your budgeted amount. For an **Expiring Budget** for **End Date**, choose the date for the budget to end on.
- If your budget period is **Monthly**: Choose the **Start Month** to begin tracking against your budgeted amount. For an **Expiring Budget**, for **End Month**, choose the month that you want the budget to end on.

For **Start Month**, choose the month that you want the budget to start on.

For an **Expiring Budget**, for **End Month**, choose the month that you want the budget to end on.

All budget times are in UTC.

11. (Optional) Under **Budget parameters (optional)**, for **Filtering**, choose one or more of the **available filters** (p. 106). Your choice of budget type determines the set of filters that is displayed on the console.

**Note**
You must choose **Usage Type**, **Usage Type Group**, or both. You can create a usage budget for only one specific unit of measure at a time such as gigabyte (GB), gigabyte per month (GB-Month), hours (Hrs), or number of requests.

12. Choose **Configure alerts**.

13. Under **Configure alerts**, for **Alert 1**, choose **Actual** to create a notification for actual spend and **Forecast** to create a notification for your forecasted spend.

The **Forecast** option is not available for **Daily Budgets** because the daily budgeted amount is always evaluated against the day before.

14. For **Alert threshold**, enter the amount that you want to be notified at. This can be either an absolute value or a percentage. For example, for a budget of 200 dollars, if you want to be notified at 160 dollars (80% of your budget), enter “160” for an absolute budget or “80” for a percentage budget.

Next to the amount, choose **Absolute amount** to be notified when the threshold amount is passed and **% of budgeted amount** to be notified when the threshold percentage of the budget is passed.

15. (Optional) For **Email contacts**, enter the email addresses that you want the notifications to be sent to and choose **Add email contact**. Separate multiple email addresses with a comma. A notification can have up to 10 email addresses.

To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

16. (Optional) For **SNS topic ARN**, enter the ARN for your Amazon SNS topic and then choose **Verify**. If you want to use an Amazon SNS topic for your notification but don’t have one, see Create a Topic in the Amazon Simple Notification Service Developer Guide.

AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the **Verify**
Creating a budget

17. (Optional) Choose Add a budget action.
   a. Configure your notification settings for your action. This defaults to the same notification settings created in Creating an Amazon SNS topic for budget notifications (p. 112).
   b. In the Choose your budget action section, choose an IAM role to allow AWS Budgets to perform an action on your behalf. If you don’t have the proper permissions assigned, AWS Budgets can’t run your configured actions.
      For more information and examples for IAM role permissions, see Allow AWS Budgets to apply IAM policies and SCPs and target EC2 and RDS instances (p. 192).
   c. Choose the action type you want AWS Budgets to apply on your behalf.
      You can choose from applying an IAM policy, a service control policy (SCP), or targeting specific Amazon EC2 or Amazon RDS instances. You can apply multiple budget actions to a single threshold. Only a management account can apply SCPs.
   d. Choose whether you want to run these actions automatically or through a workflow approval process. The workflow approval is set as your default experience.

18. Choose Confirm budget.
19. Review your budget settings, and choose Create.

Important
When you finish creating a budget with Amazon SNS notifications, Amazon SNS sends a confirmation email to the email addresses that you specify. The subject line is AWS Notification - Subscription Confirmation. A recipient must choose Confirm subscription in the confirmation email to begin receiving notifications.

Creating a reservation budget

Use this procedure to create a budget for RI utilization or RI coverage.

To create a reservation budget

2. In the navigation pane, choose Budgets.
3. At the top of the page, choose Create budget.
4. For Select budget type, choose Reservation budget.
5. Choose Set up your budget.
6. For Name, enter the name of your budget. Your budget name must be unique within your account and can use A-Z, a-z, spaces, and the following characters:

_. : / = + % @

7. For Period, choose how often you want the budget to reset the actual and forecasted spend. Choose Daily for every day, Monthly for every month, Quarterly for every three months, or Annually for every year.
All budget times are in UTC.

8. For **Reservation budget type**, choose whether you want the budget to track **RI Utilization** or **RI Coverage**.

   RI utilization is how much of your reservation you've used, and RI coverage is how much of your instance usage a reservation covers.

9. For **Service**, choose the service whose instances you want the budget to track.

10. For **Utilization threshold**, enter the utilization or coverage percentage that you want AWS to notify you at. For example, for a utilization budget where you want to stay above 80 percent RI utilization, enter 80, and the budget notifies you when you go below 80 percent utilization. For a coverage budget where you want to make sure that you stay above 80 percent, enter 80, and the budget notifies you when your instance coverage goes below 80 percent.

11. (Optional) Under **Budget parameters (optional)**, for **Filtering**, choose one or more of the available filters (p. 106). Your choice of budget type determines the set of filters that is displayed on the console.

12. Choose **Configure alert**. You can configure only one alert for a reservation budget.

13. (Optional) Under **Configure alerts**, for **Email contacts**, enter the email addresses that you want the notifications to be sent to and then choose **Add email contact**. Separate multiple email addresses with a comma. A notification can have up to 10 email addresses.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

14. (Optional) Under **Configure alerts**, for **SNS topic ARN**, select **Notify via Amazon Simple Notification Service (SNS) topic** and enter or paste the ARN for your Amazon SNS topic and then choose **Verify**. If you want to use an Amazon SNS topic for your notification but don’t have one, see **Create a Topic** in the Amazon Simple Notification Service Developer Guide.

   AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the Verify step fails, check the Amazon SNS topic policy to make sure that it allows your budget to publish to that topic.

   For a sample policy and instructions on granting your budget permissions, see Creating an Amazon SNS topic for budget notifications (p. 112). A notification can be subscribed to only one Amazon SNS topic.

15. Choose **Confirm budget**.

16. Review your budget settings, and choose **Create**.

   **Important**

When you finish creating a budget with Amazon SNS notifications, Amazon SNS sends a confirmation email to the email addresses that you specify. The subject line is AWS Notification - Subscription Confirmation. A recipient must choose Confirm subscription in the confirmation email to begin receiving notifications.

**Creating a Savings Plans budget**

Use this procedure to create a budget for savings plans utilization or Savings Plans coverage.
To create a Savings Plans budget

2. In the navigation pane, choose **Budgets**.
3. At the top of the page, choose **Create budget**.
4. For **Select budget type**, choose **Savings Plans budget**.
5. Choose **Set up your budget**.
6. For **Name**, enter the name of your budget. Your budget name must be unique within your account and can use A-Z, a-z, spaces, and the following characters: 

   - : / = + % @

7. For **Period**, choose how often you want the budget to reset the actual and forecasted spend. Choose **Daily** for every day, **Monthly** for every month, **Quarterly** for every three months, or **Annually** for every year. All budget times are in UTC.
8. For **Savings Plans budget type**, choose what you want the budget to track.

   - **Savings Plans Utilization** is how much of your Savings Plans you've used.
   - **Savings Plans Coverage** is how much of your usage a Savings Plan covers.
9. For **Utilization threshold**, enter the utilization percentage that you want AWS to notify you at. For example, for a utilization budget where you want to stay above 90% Savings Plans utilization, enter 90, and the budget notifies you when your overall Savings Plans utilization goes below 90%.
10. For **Coverage threshold**, enter the coverage percentage that you want AWS to notify you at. For example, for a coverage budget where you want to stay above 80%, enter 80. Budget notifies you when your overall coverage goes below 80%.
11. (Optional) Under **Budget parameters (optional)**, for **Filtering**, choose one or more of the available filters (p. 106). Your choice of budget type determines the set of filters that is displayed on the console.
12. Choose **Configure alerts**. You can configure one alert only for a Savings Plans budget.
13. (Optional) For **Email contacts**, enter the email addresses that you want the notifications to be sent to and choose **Add email contact**. Separate multiple email addresses with a comma. A notification can have up to 10 email addresses.

To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.

14. (Optional) For **SNS topic ARN**, enter the ARN for your Amazon SNS topic and then choose **Verify**. If you want to use an Amazon SNS topic for your notification but don't have one, see **Create a Topic** in the *Amazon Simple Notification Service Developer Guide*.

AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the **Verify** step fails, check the Amazon SNS topic policy to make sure that it allows your budget to publish to that topic.

For a sample policy and instructions on granting your budget permissions, see **Creating an Amazon SNS topic for budget notifications** (p. 112). A notification can be subscribed to only one Amazon SNS topic.
15. Choose **Confirm budget**.
Available budget filters

Usage Type Group

Choose one of the groups provided, such as S3: Data Transfer - Internet (Out) (GB). A usage type group is a collection of usage types that have the same unit of measure. If you choose both the Usage Type Group and the Usage Type filters, Cost Explorer shows you usage types that are automatically constrained to the group unit of measure. For example, when you choose the group EC2: Running Hours (Hrs) and then choose the EC2-Instances filter for Usage Type, Cost Explorer shows you only the usage types that are measured in hours.

Usage Type

Choose a filter such as S3 and then choose a usage type value, such as DataTransfer-Out-Bytes (GB). You can create a usage budget only for a specific unit of measure. If you choose Usage Type but not Usage Type Group, Cost Explorer shows you all the available units of measure for the usage type.

Service

Choose an AWS service. You can also use the Service dimension to filter costs by specific AWS Marketplace software. This includes your costs for specific AMIs, web services, and desktop apps. For more information, see What Is AWS Marketplace?

Note
You can use this filter only for cost, RI utilization, or RI coverage budgets. Cost Explorer doesn't show revenue or usage for the AWS Marketplace software. The RI utilization and RI coverage reports allow filtering by only one service at a time and only for the following services:
- Amazon Elastic Compute Cloud - Compute
- Amazon Redshift
- Amazon Relational Database Service
- Amazon ElastiCache
- Amazon Elasticsearch Service

Legal Entity

Choose the provider that provides your AWS services. For AWS services, AWS is the legal entity. For third-party services that are sold through AWS Marketplace, AWS Marketplace is the legal entity.

Linked Account

Choose an AWS account that is a member of the account that you're creating the budget for.

Note
Do not use this filter within a member account. If the current account is a member account, filtering by linked account is not supported.

Tag

If you have activated any tags, choose a resource tag. A tag is a label that you can use to organize your resource costs and track them on a detailed level. There are AWS generated tags and user-defined tags. You must activate tags to use them. For more information, see Activating the AWS-Generated Cost Allocation Tags (p. 131) and Activating User-Defined Cost Allocation Tags (p. 133).

Purchase Option

Choose On Demand Instances or Standard Reserved Instances.

Availability Zone

Choose the Availability Zone in which the resource that you want to create a budget for is running.
API Operation

Choose an action, such as CreateBucket.

Billing Entity

Choose the organization that bills you for a service. For AWS service charges, AWS is the billing entity. For third-party services that are sold through AWS Marketplace, AWS Marketplace is the billing entity.

Instance Type

Choose the type of instance that you want to track with this budget.

Instance Family

Choose the family of instances to track using this budget.

Platform

Choose the operating system that your RI runs on. Platform is either Linux or Windows.

Tenancy

Choose whether you share an RI with another user or not. Tenancy is either Dedicated or Default.

Savings Plans Type

Choose what you want to budget for, between Compute Savings Plans and EC2 Instance Savings Plans. The Savings Plans type filter is only available for Savings Plans utilization budgets.

Viewing your budgets

The Budgets dashboard shows you the state of your budgets at a glance. Your budgets are listed on the dashboard along with the following data:

- Your current costs and usage incurred for a budget during the budget period
- Your budgeted costs or usage for the budget period
- Your forecasted usage or costs for the budget period
- A percentage that shows your costs or usage compared to your budgeted amount
- A percentage that shows your forecasted costs or usage compared to your budgeted amount

To view your budgets

2. On the navigation pane, choose Budgets.
3. To see the filters and cost variances for your budgets, choose the budget's name in your list of budgets.

Reading your budgets

After you choose your budget name, you see your budget details page. This page includes the following information:

- Current vs budgeted – Your current incurred costs compared to your budgeted costs.
- Forecasted vs budgeted – Your forecasted costs compared to your budgeted costs.
• **Alerts** – Any alerts or notifications about the state of your budgets.
• **Budget History** – A table showing the history of your budgets. **QUARTERLY** budgets show the last four quarters of history, and **MONTHLY** budgets show the last 12 months. Budget history isn’t available for **ANNUAL** budgets.

If you change the budgeted amount for a budget period, the budgeted amount in the table is the last budgeted amount. For example, if you have a monthly budget set for 100 in January and change the budget to 200 in February, the February line in the table shows only the 200.

• **Budget details** – The period, type, and filters that you used when you created this budget.
• **Budgeted amount** – The budgeted amount for the current and future planned periods for Monthly or Quarterly Planning budgets.

You can use this information to see how well your budget has matched your costs and usage in the past. You can also download all of the data that Budgets used to create the table using the following procedure.

**To download a budget CSV**

2. On the navigation pane, choose **Budgets**.
3. To see the filters and cost variances for your budgets, choose the budget's name in your list of budgets.
4. In **Budget History**, choose **Download as CSV**.
5. Follow the instructions onscreen.

**Editing a budget**

You can't edit the budget name.

**To edit a budget**

2. On the navigation pane, choose **Budgets**.
3. On the **Budgets** page, choose the budget that you want to edit from your list of budgets.
4. Choose **Edit budget**.
5. Change the parameters that you want to edit. You can’t change the budget name.
6. Choose **Configure alerts**.
7. Choose **Confirm budget**.
8. Choose **Done**.

**Downloading a budget**

You can download your budgets as a **CSV** file. The file includes all of the data for all of your budgets, such as Budget Name, Current Value and Forecasted Value, Budgeted Value, and more.

**To download a budget**

Copying a budget

You can copy an existing budget to a new one. This enables you to retain the filters and notification settings from your original budget while still allowing you to make changes. Billing and Cost Management automatically populates the fields on the creation page for the new budget, where you can update the budget parameters.

To copy a budget

Budgets use the same filters as Cost Explorer. For more information about the filters, see Filtering the data that you want to view (p. 65).

2. On the navigation pane, choose Budgets.
3. From the list of budgets, choose the budget's name that you want to copy in your list of budgets.
4. At the top of the page, choose ... and choose Copy.
5. Change the parameters that you want to update. You must change the budget name.
6. Choose Configure alerts.
7. Choose Confirm budget.
8. Choose Create.

Deleting a budget

You can delete your budgets and the associated email and Amazon SNS notifications at any time. You can't recover a budget after you delete it. Deleting a budget also deletes all notifications and notification subscribers.

To delete a budget

2. On the navigation pane, choose Budgets.
3. On the Budgets page, choose the budget's name in your list of budgets.
4. On the budget page box, under ..., choose Delete.

Configuring AWS Budgets controls

You can use AWS Budgets to configure cost savings controls, or actions, that run either automatically on your behalf or by using a workflow approval process. You can use actions to define an explicit response that you want to take when a budget exceeds its action threshold. You can trigger these alerts on actual or forecasted cost and usage budgets.

Your available actions include applying an IAM policy or a service control policy (SCP), or targeting specific Amazon EC2 or Amazon RDS instances in your account. You can use SCPs so that you can no longer provision any new resources during the budgeted period.
**Note**
From the management account, you can apply an SCP to another account. However, you can't target Amazon EC2 or Amazon RDS running resources in another account.

You can also configure multiple actions to trigger at the same notification threshold. For example, you can configure actions to trigger automatically when you reach 90 percent of your forecasted costs for the month. To do so, perform the following actions:

- Apply a custom Deny IAM policy that limits the ability for a user, group, or role to provision additional Amazon EC2 resources.
- Target specific Amazon EC2 instances in US East (N. Virginia) us-east-1.

To configure a budget action, first follow the process for Creating a cost budget (p. 98) or Editing a budget (p. 108), and select **Configure thresholds**.

**To configure a budget action**

1. Under **Configure thresholds**, choose the one of the following options:
   - **Actual** - This creates a notification for your actual spend.
   - **Forecast** - This creates a notification for your forecasted spend.
2. Under **Alert threshold**, enter the amount (absolute value or percentage) you want to be notified at.
   
   For example, your budget is $200 and you want to be notified at $160. Enter 160 as your absolute value, or 80 as your percentage.
3. Choose either **Absolute amount** or **% of budgeted amount**:
   - **Absolute amount** - You are notified when the threshold amount has passed.
   - **% of budgeted amount** - You are notified when the threshold percentage of the budget has passed.
4. (Optional) For **SNS topic ARN**, enter the Amazon Resource Name (ARN) for your Amazon SNS topic, and then choose **Verify**. If you want to use an Amazon SNS topic for your notification but don't have one, see Creating an Amazon SNS topic in the Amazon Simple Notification Service Developer Guide.

   AWS verifies that your budget has permission to send notifications to your Amazon SNS topic by sending a test email to your Amazon SNS topic. If the Amazon SNS topic ARN is valid but the Verify step fails, check the Amazon SNS topic policy to make sure that it allows your budget to publish to that topic.

   For a sample policy and instructions on granting your budget permissions, see Creating an Amazon SNS topic for budget notifications (p. 112). A notification can be subscribed to only one Amazon SNS topic.

   To receive a notification, you must specify an email address. You can also specify an Amazon SNS topic.
5. (Optional) Choose **Add a budget action**.
   a. Configure your notification settings for your action. This defaults to the same notification settings created in Creating an Amazon SNS topic for budget notifications (p. 112).
   b. In the **Choose your budget action** section, choose an IAM role to allow AWS Budgets to perform an action on your behalf.

   **Note**
   If you don't have proper permissions configured and assigned for the user and for AWS Budgets, AWS Budgets can't execute your configured actions. To ensure proper configuration and execution, we've provided managed policies so your AWS Budgets actions work as intended. We recommend you use these IAM policies to be sure
you don't have to update your existing IAM policy for AWS Budgets when a new functionality is included. We will add new capabilities to the managed policy by default. For details about managed policies, see Managed policies (p. 179).

For more information and examples for IAM role permissions, see Billing and Cost Management actions policies (p. 173).

c. Choose the action type you want AWS Budgets to apply on your behalf.

You can choose from applying an IAM policy, a service control policy (SCP), or targeting specific Amazon EC2 or Amazon RDS instances. You can apply multiple budget actions to a single threshold. Only a management account can apply SCPs.

d. Choose whether you want to run these actions automatically or through a workflow approval process. The workflow approval is set as your default experience.

6. Choose **Confirm budget**.

7. Review your budget settings, and choose **Create**.

After you create an action, you can view the status of your actions from the **Budgets dashboard** using the **Actions** column. This column shows your configured actions count, actions waiting for your approval (**pending actions**), and your successfully completed actions.

### Reviewing and approving your budget action

You receive a notification to inform that an action is pending or has already run on your behalf, regardless of your action preferences. The notification includes a link to the **Budget details** page of the action in question. You can also navigate to the **Budget details** page by choosing the budget name on the **Budget dashboard**.

On the **Budget details** page, you can review and approve your budget action.

**To review and approve your budget action**

1. Choose **More info** on a threshold with an associated action.
2. Review the notification details on the **Action** page.
   
   - **Pending actions** - This lists actions waiting on your approval. This appears only if you have pending actions.
   - **Expand** - Expand the action to see the action details (for example, action type or tasks).
3. Choose **Execute action**.
4. Choose **Yes**.

Your pending actions move from the **pending** status in **Action history**, listing the newest actions at the top. AWS Budgets shows actions configured and run in the last 60 days. For a full actions history, you can view the information using AWS CloudTrail, or by calling the **DescribeBudgetActionHistories** API.

### Reversing a previous action

You can review and undo previously completed actions from the **Action history** table. Each status is defined as follows:

- **Standby** - AWS Budgets is actively evaluating the action.
- **Pending** - The action is triggered, and is waiting for your approval.
- **Execution success** - The action successfully completed.
- **Reverse success** - You chose to undo the action. AWS Budgets will no longer evaluate the action for the remaining budgeted period.
If you want AWS Budgets to reevaluate the reversed action during the same period, you can choose **reset action**. For example, you triggered a read-only policy but then got approval from your manager to increase your budget and adjust your budgeted amount during the current period.

## Creating an Amazon SNS topic for budget notifications

When you create a budget that sends notifications to an Amazon Simple Notification Service (Amazon SNS) topic, you need to either have a preexisting Amazon SNS topic or create one. Amazon SNS topics allow you to send notifications over SNS in addition to email. Your budget must have permissions to send a notification to your topic.

To create an Amazon SNS topic and grant permissions to your budget, use the Amazon SNS console.

### To create an Amazon SNS notification topic and grant permissions

2. On the navigation pane, choose **Topics**.
3. Choose **Create topic**.
4. For **Name**, enter the name for your notification topic.
5. (Optional) For **Display name**, enter the name that you want displayed when you receive a notification.
7. In the policy text field, after "Statement": [, add the following text:

   ```json
   { "Sid": "E.g., AWSBudgetsSNSPublishingPermissions", "Effect": "Allow", "Principal": { "Service": "budgets.amazonaws.com" }, "Action": "SNS:Publish", "Resource": "your topic ARN" },
   ```

8. Replace **E.g., AWSBudgetsSNSPublishingPermissions** with a string. The Sid must be unique within the policy.
9. Choose **Create topic**.
10. Under **Details**, save your ARN.
11. Choose **Edit**.
12. Under **Access policy**, replace **your topic ARN** with the Amazon SNS topic ARN from step 10.
13. Choose **Save changes**.

Your topic now appears in the list of topics on the **Topics** page.

## Troubleshooting

You might encounter the following error messages when you're creating your Amazon SNS topic for budget notifications.
Creating an Amazon SNS topic for budget notifications

Please comply with SNS ARN format

There’s a syntax error in the ARN you replaced (step 9). Confirm the ARN for proper syntax and formatting.

Invalid SNS topic

AWS Budgets doesn’t have access to the SNS topic. Confirm that you’ve allowed budget.amazonaws.com the ability to publish messages to this SNS topic, in the SNS topic’s resource based policy.

The SNS topic is encrypted

You have encryption enabled on the SNS topic. The SNS topic won’t work without additional permissions. Disable encryption on the topic, and refresh the Budget edit page.

Checking or resending notification confirmation emails

When you create a budget with notifications, you also create Amazon SNS notifications. For notifications to be sent, you must accept the subscription to the Amazon SNS notification topic.

To confirm that your notification subscriptions have been accepted or to resend a subscription confirmation email, use the Amazon SNS console.

To check your notification status or to resend a notification confirmation email

2. On the navigation pane, choose Subscriptions.
3. On the Subscriptions page, for Filter, enter budget. A list of your budget notifications appears.
4. Check the status of your notification. Under Status, PendingConfirmation appears if a subscription hasn’t been accepted and confirmed.
5. (Optional) To resend a confirmation request, select the subscription with a pending confirmation and choose Request confirmation. Amazon SNS sends a confirmation request to the endpoints that are subscribed to the notification.

When each owner of an endpoint receives the email, they must choose the Confirm subscription link to activate the notification.

Protecting your Amazon SNS budget alerts data with SSE and AWS KMS

You can use server-side encryption (SSE) to transfer sensitive data in encrypted topics. SSE protects Amazon SNS messages by using keys managed in AWS Key Management Service (AWS KMS).

To manage SSE using AWS Management Console or the AWS Service Development Kit (SDK), see Enabling Server-Side Encryption (SSE) for an Amazon SNS Topic in the Amazon Simple Notification Service Getting Started Guide.

To create encrypted topics using AWS CloudFormation, see the AWS CloudFormation User Guide.

SSE encrypts messages as soon as Amazon SNS receives them. The messages are stored encrypted and are decrypted using Amazon SNS only when they’re sent.

Configuring AWS KMS permissions

You must configure your AWS KMS key policies before you can use SSE. The configuration enables you to encrypt topics, as well as encrypt and decrypt messages. For details about AWS KMS permissions,
see AWS KMS API Permissions: Actions and Resources Reference in the AWS Key Management Service Developer Guide.

You can also use IAM policies to manage AWS KMS key permissions. For more information, see Using IAM Policies with AWS KMS.

**Note**
Although you can configure global permissions to send and receive message from Amazon SNS, AWS KMS requires you to name the full ARN of customer master keys (CMK) in the specific Regions. You can find this in the Resource section of an IAM policy.
You must ensure that the key policies of the CMK allow the necessary permissions. To do this, name the principals that produce and consume encrypted messages in Amazon SNS as users in the CMK policy.

**To enable compatibility between AWS Budgets and encrypted Amazon SNS topics**

1. Create a CMK.
2. Add the following text to the CMK policy.

```json
{
  "Version": "2012-10-17",
  "Statement": [{
    "Effect": "Allow",
    "Principal": {
      "Service": "budgets.amazonaws.com"
    },
    "Action": [
      "kms:GenerateDataKey*",
      "kms:Decrypt"
    ],
    "Resource": "*"
  }]
}
```

3. Enable SSE for your SNS topic.

**Note**
Be sure that you're using the same CMK that grants AWS Budgets the permissions to publish to encrypted Amazon SNS topics.

4. Choose Save Changes.

**Receiving budget alerts in Amazon Chime and slack**

You can receive your AWS Budgets alerts in Amazon Chime and Slack by using AWS Chatbot.

AWS Chatbot enables you to receive AWS Budgets alerts directly into your designated Slack channel or Amazon Chime chat room.

**To begin receiving your budget alerts in slack and Amazon Chime**

1. Follow Creating a budget (p. 98) or Editing a budget (p. 108) and select Configure alerts.
2. Add an Amazon SNS topic as an alert recipient to a specific alert or alerts. To ensure that AWS Budgets has permissions to publish to your Amazon SNS topics, see Creating an Amazon SNS Topic for Budget Notifications (p. 112).
3. Select Confirm Budget.
4. Select Done.
5. Open the AWS Chatbot console.
7. Choose Configure.

There are specific authorization processes for each endpoint: for example, Slack channel, Amazon Chime rooms, AWS Chatbot IAM permissions, and SNS topics receiving the budget alerts.
8. Choose Slack workspace.
9. Choose a channel type.
   - Public: Everyone in your workspace can see or join the channel
   - Private: The channel is viewable only by invitation
10. Either select an existing IAM role for AWS Chatbot to assign or create a new IAM role.
11. Choose a role name.
12. Select the Amazon SNS Region.
13. Select the SNS topic.
   
   Note
   You can send AWS Budgets alerts to multiple Amazon SNS topics and Regions. At least one of the Amazon SNS topics must match the Amazon SNS topic or topics of your budget or budgets.

14. Select Configure.

---

**Reporting your budget metrics with budget reports**

AWS Budgets enables you to configure a report to monitor the performance of your existing budgets on a daily, weekly, or monthly cadence and deliver that report to up to 50 email addresses.

You can create up to 50 reports per standalone account or AWS Organizations management account. Each budget report costs $.01 USD per report delivered, regardless of the number of recipients receiving the report. For example, a daily budget report costs $.01 per day, a weekly budget report costs $.01 per week, and a monthly budget report costs $.01 per month.

If you use consolidated billing in an organization and you own the management account, you can use IAM policies to control access to budgets by member accounts. By default, owners of member accounts can create their own budgets but can't create or edit budgets for other users. You can use IAM to allow users in a member account to create, edit, delete, or read the budget for your management account. Do this, for example, to allow another account to administer your budget. For more information, see Overview of managing access permissions (p. 172). For more information about AWS Organizations, see the AWS Organizations User Guide.

**Topics**
- Creating an AWS Budgets report (p. 115)
- Editing an AWS Budgets report (p. 116)
- Copying an AWS Budgets report (p. 117)
- Deleting an AWS Budgets report (p. 117)

---

**Creating an AWS Budgets report**

Use the following procedure to create an AWS Budgets report.
To create an AWS Budgets report
2. In the navigation pane, choose Budget Reports.
3. On the top right of the page, choose Create Budget report.
4. For Report name, enter the name of the report. This name will be the subject line of your budget report email.
   You can change your report name at any time.
5. Select the number of budgets to include in your report.
   You can filter by Budget name at the top of the table to simplify your selection. Selecting Budget name sends you to the budget details page. The table also shows Budget type, Filters, Budgeted amount, and Budget progress.
   **Note**
   You can select up to 50 budgets. If you select more, you can’t proceed to the next step until you’ve changed your selection to 50 or less.
7. Choose a Report frequency.
   • Daily
   • Weekly: Specify the day of the week.
   • Monthly: Specify the day of the month. If you select the twenty-ninth through the thirty-first and the next month doesn’t have that day, your report is delivered on the final day of the month.
   **Note**
   Reports are delivered at approximately 0:00 UTC on the specified day.
8. Enter Email recipient(s).
   Add multiple email addresses separated by commas. You can have up to 50 email recipients for each budget report.
10. Choose Create.

Your report appears on the AWS Budgets Reports dashboard. You can filter your reports by Report name at the top of the table. The dashboard also shows Frequency, number of Budget(s) monitored, and the Recipients of each report.

Editing an AWS Budgets report

You can use this procedure to edit an AWS Budgets report.

To edit an AWS Budgets report
2. In the navigation pane, choose Budget Reports.
3. Select either the Report name or ... on the right of each row.
4. Choose Edit.
5. Change any parameter that you want to edit.
Copying an AWS Budgets report

Use the following procedure to copy an AWS Budgets report.

To copy an AWS Budgets report
2. In the navigation pane, choose Budget Reports.
3. Select either the Report name or ... on the right of each row.
4. Choose Copy.
5. Change the report name.
6. (Optional) Change any parameter that you want to edit.
7. Choose Configure delivery settings.
8. Choose Confirm budget report.

Deleting an AWS Budgets report

Use the following procedure to delete an AWS Budgets report.

To delete an AWS Budgets report
2. In the navigation pane, choose Budget Reports.
3. Select either the Report name or ... located on the right of each row.
4. Choose Delete.

Detecting unusual spend with anomaly detection

Anomaly detection is in public preview for AWS Billing and Cost Management and is subject to change. Your use of anomaly detection is subject to the Preview Service Participation terms of the AWS Service Terms (Section 1.10).

Anomaly detection is an AWS Cost Management feature that uses machine learning to continuously monitor your cost and usage to detect unusual spends. Using anomaly detection includes the following benefits:

- Receive alerts individually in aggregated reports. You can receive alerts in an email or an Amazon SNS topic.
- Evaluate your spend patterns using machine learning methods to minimize false positive alerts. For example, you can evaluate weekly or monthly seasonality and organic growth.
- Analyze and determine the root cause of the anomaly, such as account, service, Region, or usage type that is driving the cost increase.
• Configure how you need to evaluate your costs. You can choose whether you want to analyze all of your AWS services independently, or by member accounts, cost allocation tags, or cost categories.

**Note**
Anomaly detection runs approximately three times a day after your billing data is processed. You might experience a slight delay in receiving alerts. As a result, you might accumulate additional costs over the notified amount by the time you receive the alert.

**Topics**
- Setting up your anomaly detection (p. 118)
- Getting started with anomaly detection (p. 119)
- Editing your alerting preferences (p. 121)
- Creating an Amazon SNS topic for anomaly detection (p. 121)

**Setting up your anomaly detection**

*Anomaly detection is in public preview for AWS Billing and Cost Management and is subject to change. Your use of anomaly detection is subject to the Preview Service Participation terms of the AWS Service Terms (Section 1.10).*

The overviews in this section help you get started with anomaly detection in AWS Billing and Cost Management.

**Topics**
- Enabling Cost Explorer (p. 118)
- Controlling access using IAM (p. 118)
- Accessing the console (p. 118)
- Limits (p. 119)

**Enabling Cost Explorer**

Anomaly detection is a feature within Cost Explorer. To access anomaly detection, enable Cost Explorer. For information about how to enable Cost Explorer using the console, see Enabling Cost Explorer (p. 57).

**Controlling access using IAM**

After you enable Cost Explorer at the management account level, you can use AWS Identity and Access Management (IAM) to manage access to your billing data for individual IAM users. You can then grant or revoke access on an individual level for each account, rather than granting access to all member accounts.

An IAM user must be granted explicit permission to view pages in the Billing and Cost Management console. With the appropriate permissions, the IAM user can view costs for the AWS account that the IAM user belongs to. For the policy that grants the necessary permissions to an IAM user, see Billing and Cost Management actions policies (p. 173).

**Accessing the console**

When your setup is complete, access anomaly detection.
To access anomaly detection

2. On the navigation pane, choose Anomaly Detection.

Limits

For the default limit, see Anomaly detection (p. 197).

Getting started with anomaly detection

Anomaly detection is in public preview for AWS Billing and Cost Management and is subject to change. Your use of anomaly detection is subject to the Preview Service Participation terms of the AWS Service Terms (Section 1.10).

When you start using anomaly detection in AWS Billing and Cost Management, you have several options for configuring your monitor and alert preferences.

Topics

- Creating your anomaly monitors and alert preferences (p. 119)
- Viewing your detected anomalies and root causes (p. 120)

Creating your anomaly monitors and alert preferences

You can configure your anomaly detection so that it detects anomalies at a lower granularity and spend patterns, in context to your monitor type.

For example, your spend patterns for Amazon EC2 usage might be different from your AWS Lambda or Amazon S3 spend patterns. By segmenting spends by AWS services, anomaly detection can detect separate spend patterns that help decrease false positive alerts. You can also create monitors that evaluate specific cost allocation tags, member accounts, and cost categories based on your AWS account structure.

As you create your monitors, you can configure your alerting preferences specific to each monitor.

To create a monitor

2. In the navigation pane, choose Anomaly Detection.
4. Choose Create monitor.
5. Under How to monitor your spend, choose a monitor type.
   
   For more information about each monitor type and best practices, see Monitor types (p. 120).
6. For Alert threshold, enter the dollar amount threshold to receive alerts.
   
   A threshold is not the same as an anomaly. Anomalies are detected using machine learning. For example, you can set a $0 threshold alert of every anomaly, even if the cost impact is $1.
7. Under Alerting frequency, choose your preferred notification frequency.
• **Individual alerts** - The alert notifies you as soon as an anomaly is detected. You might receive multiple alerts throughout a day. These notifications require an Amazon SNS topic.

• **Daily summary** - The alert notifies you with a daily summary when anomalies are detected. You receive one email containing information for multiple anomalies that occurred that day. These notifications require at least one email recipient.

• **Weekly summary** - The alert notifies you with a weekly summary when anomalies are detected. You receive one email containing information for multiple anomalies that occurred that week. These notifications require at least one email recipient.

8. For **Monitor name**, enter a name for your anomaly monitor. We recommend the name to be a short description so that you know what the monitor represents when you view your monitors on the **Overview** page.

9. Choose **Create monitor**.

**Monitor types**

You can choose the monitor type that suits your account structure. Currently we offer the following monitor types:

• **AWS services** - We recommend this monitor if you don't need to segment your spend by internal organizations or environments. This single monitor evaluates all AWS services used by your individual AWS account for anomalies. When you add new AWS services, the monitor automatically begins to evaluate the new service for anomalies, so you don't have to manually configure your settings.

  Note
  Only the AWS services monitor is available within member accounts.

• **Linked account** - This monitor evaluates the total spend of an individual, or group of, member accounts. This monitor is useful if your Organizations needs to segment spend by team, product, services, or environment, that you define as individual or groups of accounts.

• **Cost category** - This monitor is recommended if you use cost categories to organize and manage your spend. This monitor type is restricted to one key: value pair.

• **Cost allocation tag** - This monitor is similar to **Linked account** because it is useful if you to need to segment your spend by team, product, services, or environment, defined by cost allocation tags. This monitor type is restricted to one key, but accepts multiple values.

We recommend that you do not create monitors that span multiple monitor types. This might lead to evaluating overlapping spends that generate duplicate alerts.

For more information about creating your Amazon SNS topic, see [Creating an Amazon SNS topic for anomaly detection (p. 121)](#).

**Viewing your detected anomalies and root causes**

After you create your monitors, anomaly detection evaluates your future spend. Based on your defined alerting preferences, you might start receiving alerts within 24 hours.

**To view your anomalies from an email alert**

1. Choose the provided **View in Anomaly Detection** link.
2. On the **Anomaly details** page, you can view the root cause analysis and cost impact of the anomaly.
3. (Optional) Choose **View in Cost Explorer** to view a graph of the time series, automatically filtered by root causes.
4. (Optional) Choose **Did you find this detected anomaly to be helpful?** to provide feedback and help improve our detection accuracy.
To view your anomalies from the AWS Cost Management console

2. In the navigation pane, choose Anomaly Detection.
3. (Optional) In the Cost monitors section, choose Monitor name to narrow any detected anomalies for a particular monitor.
4. (Optional) Choose View in Cost Explorer to view a graph of the time series, automatically filtered by root causes.
5. (Optional) Choose Did you find this detected anomaly to be helpful? to provide feedback and help improve our detection accuracy.

Editing your alerting preferences

Anomaly detection is in public preview for AWS Billing and Cost Management and is subject to change. Your use of anomaly detection is subject to the Preview Service Participation terms of the AWS Service Terms (Section 1.10).

You can adjust your alerting preferences in AWS Billing and Cost Management to match your needs. If you find that you are receiving too many or too few anomaly alerts, you can edit your preferences at any time.

To edit your alerting preferences

2. In the navigation pane, choose Anomaly Detection.
3. Choose the monitor you want to edit on the Cost monitors section.
4. Choose Edit.
   • (Alternative) Choose the individual monitor name.
   • Choose Edit monitor.
5. On the Edit monitor page, change any settings for recipients, frequency, or threshold.

Creating an Amazon SNS topic for anomaly detection

Anomaly detection is in public preview for AWS Billing and Cost Management and is subject to change. Your use of anomaly detection is subject to the Preview Service Participation terms of the AWS Service Terms (Section 1.10).

When you create an anomaly detection monitor that sends notifications to an Amazon Simple Notification Service (Amazon SNS) topic, you must either have a preexisting Amazon SNS topic or create one. Amazon SNS topics allow you to send notifications over SNS in addition to email. Anomaly detection must have permissions to send a notification to your topic.

To create an Amazon SNS notification topic and grant permissions

2. On the navigation pane, choose Topics.
3. Choose Create topic.
4. For Name, enter the name for your notification topic.
5. (Optional) For Display name, enter the name that you want displayed when you receive a notification.
7. In the policy text field, after "Statement": [ add the following text:

```json
{
   "Sid": "E.g., AWSAnomalyDetectionSNSPublishingPermissions",
   "Effect": "Allow",
   "Principal": {
      "Service": "costalerts.amazonaws.com"
   },
   "Action": "SNS:Publish",
   "Resource": "your topic ARN"
},
```

8. Replace E.g., AWSAnomalyDetectionSNSPublishingPermissions with a string. The Sid must be unique within the policy.
9. Replace your topic ARN with the Amazon SNS topic Amazon Resource Name (ARN) from step 7 in this procedure.
10. Choose Create topic.

Your topic now appears in the list of topics on the Topics page.

Checking or resending notification confirmation emails

When you create an anomaly detection monitor with notifications, you also create Amazon SNS notifications. For notifications to be sent, you must accept the subscription to the Amazon SNS notification topic.

To confirm that your notification subscriptions have been accepted or to resend a subscription confirmation email, use the Amazon SNS console.

**To check your notification status or to resend a notification confirmation email**

2. On the navigation pane, choose Subscriptions.
3. Check the status of your notification. Under Status, PendingConfirmation appears if a subscription hasn't been accepted and confirmed.
4. (Optional) To resend a confirmation request, select the subscription with a pending confirmation and choose Request confirmation. Amazon SNS sends a confirmation request to the endpoints that are subscribed to the notification.

When each owner of an endpoint receives the email, they must choose the Confirm subscription link to activate the notification.

Protecting your Amazon SNS anomaly detection alerts data with SSE and AWS KMS

You can use server-side encryption (SSE) to transfer sensitive data in encrypted topics. SSE protects Amazon SNS messages by using keys managed in AWS Key Management Service (AWS KMS).
To manage SSE using AWS Management Console or the AWS SDK, see Enabling Server-Side Encryption (SSE) for an Amazon SNS Topic in the Amazon Simple Notification Service Getting Started Guide.

To create encrypted topics using AWS CloudFormation, see the AWS CloudFormation User Guide.

SSE encrypts messages as soon as Amazon SNS receives them. The messages are stored encrypted and are decrypted using Amazon SNS only when they're sent.

### Configuring AWS KMS permissions

You must configure your AWS KMS key policies before you can use SSE. The configuration enables you to encrypt topics, in addition to encrypting and decrypting messages. For details about AWS KMS permissions, see AWS KMS API Permissions: Actions and Resources Reference in the AWS Key Management Service Developer Guide.

You can also use IAM policies to manage AWS KMS key permissions. For more information, see Using IAM Policies with AWS KMS.

**Note**

Although you can configure global permissions to send and receive message from Amazon SNS, AWS KMS requires you to name the full ARN of the customer master keys (CMK) in the specific Regions. You can find this in the Resource section of an IAM policy. You must ensure that the key policies of the CMK allow the necessary permissions. To do this, name the principals that produce and consume encrypted messages in Amazon SNS as users in the CMK policy.

To enable compatibility between anomaly detection and encrypted Amazon SNS topics

1. Create a CMK.
2. Add the following text to the CMK policy.

   ```json
   {
   "Version": "2012-10-17",
   "Statement": [{
   "Effect": "Allow",
   "Principal": {
   "Service": "costalerts.amazonaws.com"
   },
   "Action": [
   "kms:GenerateDataKey*",
   "kms:Decrypt"
   ],
   "Resource": "*"
   }]
   }
   ```

3. Enable SSE for your SNS topic.

   **Note**
   
   Be sure that you're using the same CMK that grants anomaly detection the permissions to publish to encrypted Amazon SNS topics.

4. Choose **Save Changes**.

### Managing your costs with AWS Cost Categories

You can use AWS Cost Categories to map your AWS costs and usage into meaningful categories. With cost categories, you can organize your costs using a rule-based engine. The rules that you configure will organize your costs into categories. You can then use these categories across products in the AWS Billing
and Cost Management console, including Cost Explorer, AWS Budgets, and AWS Cost and Usage Reports (AWS CUR).

You can create groupings of costs using cost categories. For example, your business is organized by teams, and each team has multiple accounts within. To build this structure in cost categories, first create a cost category named Team. Then, you can map costs to a cost category value named Team 123.

Companies commonly have multiple perspectives on their business, such as projects, cost centers, and applications, and you can create cost categories to match these perspectives. Cost category values are groups within cost categories, similar to Team 123 or Team 456 from the previous example. By creating cost categories, you can view your business in multiple, corresponding perspectives.

You can start using cost categories by creating a unique category name. Then, map costs to cost category values within the cost categories. In each cost category value, map the type of costs that belong to that value. For example, if your Team 123 consists of multiple accounts, you can write that expression by choosing the accounts dimension (is option) and selecting the applicable accounts. After creating the cost category value, continue to create other teams by adding values.

After your cost categories are created, they appear in Cost Explorer, AWS Budgets, and AWS CUR. In Cost Explorer and AWS Budgets, a cost category appears as an additional billing dimension. You can use this to filter for the specific cost category value, or group by the cost category. In AWS CUR, the cost category appears as a new column with the cost category value in each row.

Note
Cost categories are effective at the start of the current month. If you create or update your cost category in the middle of the month, it retroactively takes effect on cost and usage from the beginning of the month.

This is an administrative feature, and it can only be customized by the management account or regular accounts in AWS Organizations.

Topics
• Supported dimensions (p. 124)
• Supported operations (p. 125)
• Status (p. 125)
• Limits (p. 126)
• Term comparisons (p. 126)
• Creating cost categories (p. 126)
• Editing cost categories (p. 127)
• Deleting cost categories (p. 127)

Supported dimensions
You can select from a list of billing dimensions to create your cost category rules. These billing dimensions are used to group your data. For example, if you wanted to group a set of accounts to form a team, you would first choose the account billing dimension, and then choose the list of accounts that you want to include in the team.

The following billing dimensions are supported.

Account
This can be the AWS account name or the account ID, depending on the operation. If you're using an exact match operation (is or is not), account refers to the account ID. If you're using an approximate match operation (starts with, ends with, or contains), account refers to account name.
Supported operations

You can use these operations to create the filter expression when you're creating a cost category rule.

The following operations are supported.

**Is**

The exact match operation used to filter for the exact value specified.

**Is not**

The exact match operation used to filter for the exact value that is not specified.

**Contains**

The approximate match used to filter for a text string containing this value. This value is case sensitive.

**Starts with**

The approximate match used to filter for a text string that starts with this value. This value is case sensitive.

**Ends with**

The approximate match used to filter for a text string that ends with this value. This value is case sensitive.

### Status

You can use the console to confirm the status of whether your cost categories completed the processing of the cost and usage information. After you create or edit a cost category, it takes approximately 8 hours before it has categorized your cost and usage information in the AWS Cost and Usage Report or Cost Explorer.

There are two status states.

**Applied**

Cost categories completed processing, and the information in AWS Cost and Usage Report and Cost Explorer is up to date with the new rules.
Processing

The cost categories are still in progress.

Limits

For more information about cost categories quotas, see Quotas and restrictions (p. 196).

Term comparisons

CHARGE_TYPE is a dimension supported for cost category expressions, also called RECORD_TYPE in the Cost Explorer API. This dimension uses different terms, depending on whether you're using the console or the API/JSON editor. The following table compares the terminology used for both scenarios.

<table>
<thead>
<tr>
<th>Term comparison</th>
<th>Value in API or JSON editor</th>
<th>Name used in the console</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage</td>
<td>Usage</td>
<td></td>
</tr>
<tr>
<td>SavingsPlanCoveredUsage</td>
<td>Savings Plan Covered Usage</td>
<td></td>
</tr>
<tr>
<td>DiscountedUsage</td>
<td>Reservation applied usage</td>
<td></td>
</tr>
<tr>
<td>RIFee</td>
<td>Recurring reservation fee</td>
<td></td>
</tr>
<tr>
<td>SavingsPlanRecurringFee</td>
<td>Savings Plan Recurring Fee</td>
<td></td>
</tr>
<tr>
<td>Tax</td>
<td>Tax</td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td>Credit</td>
<td></td>
</tr>
<tr>
<td>SavingsPlanNegation</td>
<td>Savings Plan Negation</td>
<td></td>
</tr>
</tbody>
</table>

Creating cost categories

You can create cost categories to organize your cost and usage information. Regular accounts and the management account in AWS Organizations have default access to create cost categories. Rules are not mutually exclusive, and you can control the order in which the rules apply. Allow up to 24 hours after creating a cost category for your usage records to be updated with values.

Use the following procedure to create a new cost category.

To create a cost category

2. In the navigation pane, choose AWS Cost Categories.
3. At the top of the page, choose Create Cost category.
4. Under Cost category details, enter the name of your cost category. Your cost category name must be unique within your account.
5. Choose Next.
6. Choose Define category values.

Use either the Rule Builder or JSON editor to define your cost categories.
Editing cost categories

For more information about the JSON request syntax, see the AWS Billing and Cost Management API Reference.

7. For **Value**, enter the name of the cost category value.
8. Choose a billing **Dimension** from the dropdown list. You can choose **Accounts, Service, Charge Type** (for example, recurring reservation fee), or **Tag key** (Cost Allocation tag key).
9. Choose **Operator** from the dropdown list. Your options are **Is, Contains, Starts with, and Ends with**.

   **Note**
   - Contains, Starts with, and Ends with are only supported with Accounts and Tag dimensions. If you use these operators with Accounts, the engine evaluates against account name, and not account ID.

10. Choose a filtered value for your **Dimension** in the attribute selector.
11. (Optional) To rearrange the rule order, use the arrows or change the number on the top right of each rule.
12. (Optional) To delete a rule, select **Remove** on the top right of each rule.

**Editing cost categories**

You can edit your AWS Cost Categories using the following procedure. Cost category names can't be edited.

**To edit a cost category**

2. In the navigation pane, choose **cost categories**.
3. Select the cost category to edit.
4. Choose **Edit cost category**.
5. Make changes to parameters and choose **Confirm cost category**.

**Deleting cost categories**

You can delete your cost categories using the following procedure.

**To delete a cost category**

2. In the navigation pane, choose **Cost categories**.
3. Select the cost category to delete.
4. Choose **Delete cost category**.

**Using Cost Allocation Tags**

A tag is a label that you or AWS assigns to an AWS resource. Each tag consists of a **key** and a **value**. For each resource, each tag key must be unique, and each tag key can have only one value. You can use tags to organize your resources, and cost allocation tags to track your AWS costs on a detailed level. After you activate cost allocation tags, AWS uses the cost allocation tags to organize your resource costs on your
cost allocation report, to make it easier for you to categorize and track your AWS costs. AWS provides two types of cost allocation tags, an AWS generated tags and user-defined tags. AWS defines, creates, and applies the AWS generated tags for you, and you define, create, and apply user-defined tags. You must activate both types of tags separately before they can appear in Cost Explorer or on a cost allocation report.

The following diagram illustrates the concept. In the example, you've assigned and activated tags on two Amazon EC2 instances, one tag called Cost Center and another tag called Stack. Each of the tags has an associated value. You also activated the AWS generated tags, createdBy before creating these resources. The createdBy tag tracks who created a resource. The user-defined tags use the user prefix, and the AWS generated tag uses the aws: prefix.

![Diagram of AWS cost allocation tags](image)

After you or AWS applies tags to your AWS resources (such as Amazon EC2 instances or Amazon S3 buckets) and you activate the tags in the Billing and Cost Management console, AWS generates a cost allocation report as a comma-separated value (CSV file) with your usage and costs grouped by your active tags. You can apply tags that represent business categories (such as cost centers, application names, or owners) to organize your costs across multiple services.

The cost allocation report includes all of your AWS costs for each billing period. The report includes both tagged and untagged resources, so that you can clearly organize the charges for resources. For example, if you tag resources with an application name, you can track the total cost of a single application that runs on those resources. The following screenshot shows a partial report with columns for each tag.

![Partial cost allocation report](image)

At the end of the billing cycle, the total charges (tagged and untagged) on the billing report with cost allocation tags reconciles with the total charges on your Bills page total and other billing reports for the same period.
You can also use tags to filter views in Cost Explorer. For more information about Cost Explorer, see Analyzing your costs with Cost Explorer (p. 57).

For more information about activating the AWS generated tags, see Activating the AWS-Generated Cost Allocation Tags (p. 131). For more information about applying and activating user-defined tags, see User-Defined Cost Allocation Tags (p. 132). All tags can take up to 24 hours to appear in the Billing and Cost Management console.

**Note**
- As a best practice, do not include sensitive information in tags.
- Only management account in an organization and single accounts that are not members of an organization have access to the Cost Allocation Tags manager in the Billing console.

**Topics**
- AWS-Generated Cost Allocation Tags (p. 129)
- User-Defined Cost Allocation Tags (p. 132)
- Monthly cost allocation report (p. 134)

### AWS-Generated Cost Allocation Tags

The AWS generated tags createdBy is a tag that AWS defines and applies to supported AWS resources for cost allocation purposes. To use the AWS generated tags, a management account owner must activate it in the Billing and Cost Management console. When a management account owner activates the tag, the tag is also activated for all member accounts. After the tag is activated, AWS starts applying the tag to resources that are created after the AWS generated tags was activated. The AWS generated tags is available only in the Billing and Cost Management console and reports, and doesn't appear anywhere else in the AWS console, including the AWS Tag Editor. The createdBy tag does not count towards your tags per resource limit.

The createdBy tag uses the following key-value definition:

```plaintext
key = aws:createdBy

value = account-type:account-ID or access-key:user-name or role session name
```

Not all values include all of the value parameters. For example, the value for a AWS generated tag for a root account doesn't always have a user name.

Valid values for the account-type are Root, IAMUser, AssumedRole, and FederatedUser.

If the tag has an account ID, the account-id tracks the account number of the root account or federated user who created the resource. If the tag has an access key, then the access-key tracks the IAM access key used and, if applicable, the session role name.

The user-name is the user name, if one is available.

Here are some examples of tag values:

- Root:1234567890
- Root: 1112223333 :exampleUser
- IAMUser: AIDACKCEVSQ6C2EXAMPLE :exampleUser
- AssumedRole: AKIAIOSFODNN7EXAMPLE :exampleRole
- FederatedUser:1234567890:exampleUser

For more information about IAM users, roles, and federation, see the IAM User Guide.
AWS-generated cost allocation tags are applied on a best-effort basis. Issues with services that AWS generated tags depend on, such as CloudTrail, can cause a gap in tagging.

The `createdBy` tag is applied only to the following services and resources after the following events.

<table>
<thead>
<tr>
<th>AWS Product</th>
<th>API or Console Event</th>
<th>Resource Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS CloudFormation (AWS CloudFormation)</td>
<td>CreateStack</td>
<td>Stack</td>
</tr>
<tr>
<td>AWS Data Pipeline (AWS Data Pipeline)</td>
<td>CreatePipeline</td>
<td>Pipeline</td>
</tr>
<tr>
<td>Amazon Elastic Compute Cloud (Amazon EC2)</td>
<td>CreateCustomerGateway</td>
<td>Customer gateway</td>
</tr>
<tr>
<td></td>
<td>CreateDhcpOptions</td>
<td>DHCP options</td>
</tr>
<tr>
<td></td>
<td>CreateImage</td>
<td>Image</td>
</tr>
<tr>
<td></td>
<td>CreateInternetGateway</td>
<td>Internet gateway</td>
</tr>
<tr>
<td></td>
<td>CreateNetworkAcl</td>
<td>Network ACL</td>
</tr>
<tr>
<td></td>
<td>CreateNetworkInterface</td>
<td>Network interface</td>
</tr>
<tr>
<td></td>
<td>CreateRouteTable</td>
<td>Route table</td>
</tr>
<tr>
<td></td>
<td>CreateSecurityGroup</td>
<td>Security group</td>
</tr>
<tr>
<td></td>
<td>CreateSnapshot</td>
<td>Snapshot</td>
</tr>
<tr>
<td></td>
<td>CreateSubnet</td>
<td>Subnet</td>
</tr>
<tr>
<td></td>
<td>CreateVolume</td>
<td>Volume</td>
</tr>
<tr>
<td></td>
<td>CreateVpc</td>
<td>VPC</td>
</tr>
<tr>
<td></td>
<td>CreateVpcPeeringConnection</td>
<td>VPC peering connection</td>
</tr>
<tr>
<td></td>
<td>CreateVpnConnection</td>
<td>VPN connection</td>
</tr>
<tr>
<td></td>
<td>CreateVpnGateway</td>
<td>VPN gateway</td>
</tr>
<tr>
<td></td>
<td>PurchaseReservedInstancesOffering</td>
<td>Reserved-instance</td>
</tr>
<tr>
<td></td>
<td>RequestSpotInstances</td>
<td>Spot-instance-request</td>
</tr>
<tr>
<td></td>
<td>RunInstances</td>
<td>Instance</td>
</tr>
<tr>
<td>Amazon ElastiCache (ElastiCache)</td>
<td>CreateSnapshot</td>
<td>Snapshot</td>
</tr>
<tr>
<td></td>
<td>CreateCacheCluster</td>
<td>Cluster</td>
</tr>
<tr>
<td>AWS Elastic Beanstalk (Elastic Beanstalk)</td>
<td>CreateEnvironment</td>
<td>Environment</td>
</tr>
<tr>
<td></td>
<td>CreateApplication</td>
<td>Application</td>
</tr>
<tr>
<td>Elastic Load Balancing (Elastic Load Balancing)</td>
<td>CreateLoadBalancer</td>
<td>Loadbalancer</td>
</tr>
<tr>
<td>AWS Product</td>
<td>API or Console Event</td>
<td>Resource Type</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Amazon S3 Glacier (S3 Glacier)</td>
<td>CreateVault</td>
<td>Vault</td>
</tr>
<tr>
<td>Amazon Kinesis (Kinesis)</td>
<td>CreateStream</td>
<td>Stream</td>
</tr>
<tr>
<td>Amazon Relational Database Service (Amazon RDS)</td>
<td>CreateDBInstanceReadReplica</td>
<td>Database</td>
</tr>
<tr>
<td></td>
<td>CreateDBParameterGroup</td>
<td>ParameterGroup</td>
</tr>
<tr>
<td></td>
<td>CreateDBSnapshot</td>
<td>Snapshot</td>
</tr>
<tr>
<td></td>
<td>CreateDBSubnetGroup</td>
<td>SubnetGroup</td>
</tr>
<tr>
<td></td>
<td>CreateEventSubscription</td>
<td>EventSubscription</td>
</tr>
<tr>
<td></td>
<td>CreateOptionGroup</td>
<td>OptionGroup</td>
</tr>
<tr>
<td></td>
<td>PurchaseReservedDBInstance</td>
<td>ReservedDBInstance</td>
</tr>
<tr>
<td></td>
<td>CreateDBInstance</td>
<td>Database</td>
</tr>
<tr>
<td>Amazon Redshift (Amazon Redshift)</td>
<td>CreateClusterParameterGroup</td>
<td>ParameterGroup</td>
</tr>
<tr>
<td></td>
<td>CreateClusterSnapshot</td>
<td>Snapshot</td>
</tr>
<tr>
<td></td>
<td>CreateClusterSubnetGroup</td>
<td>SubnetGroup</td>
</tr>
<tr>
<td></td>
<td>CreateCluster</td>
<td>Cluster</td>
</tr>
<tr>
<td>Amazon Route 53 (Route 53)</td>
<td>CreateHealthCheck</td>
<td>HealthCheck</td>
</tr>
<tr>
<td></td>
<td>CreatedHostedZone</td>
<td>HostedZone</td>
</tr>
<tr>
<td>Amazon Simple Storage Service (Amazon S3)</td>
<td>CreateBucket</td>
<td>Bucket</td>
</tr>
<tr>
<td>AWS Storage Gateway (AWS Storage Gateway)</td>
<td>ActivateGateway</td>
<td>Gateway</td>
</tr>
</tbody>
</table>

**Note**
The `createDBSnapshot` tag isn't applied to the snapshot backup storage.

**Activating the AWS-Generated Cost Allocation Tags**

Management account owners can activate the AWS generated tags in the Billing and Cost Management console. When a management account owner activates the tag, it's also activated for all member accounts. This tag is visible only in the Billing and Cost Management console and reports.

**To activate the AWS generated tags**

You can activate the `createdBy` tag in the Billing and Cost Management console.

2. In the navigation pane, choose **Cost Allocation Tags**.
3. Under **AWS-Generated Cost Allocation Tags**, choose the `createdBy` tag.
4. Choose **Activate**.

It can take up to 24 hours for tags to activate.

**Deactivating the AWS-Generated Cost Allocation Tags**

Management account owners can deactivate the AWS generated tags in the Billing and Cost Management console. When a management account owner deactivates the tag, it's also deactivated for all member accounts. After you deactivate the AWS generated tags, AWS no longer applies the tag to new resources. Previously tagged resources remain tagged.

**To deactivate the AWS generated tags**

2. In the navigation pane, choose **Cost Allocation Tags**.
3. Under **AWS-Generated Cost Allocation Tags**, choose **Deactivate**.

It can take up to 24 hours for tags to deactivate.

**Restrictions on AWS-Generated Cost Allocation Tags**

The following restrictions apply to the AWS generated tags:

- Only a management account can activate AWS generated tags.
- You can't update, edit, or delete AWS generated tags.
- AWS-generated cost allocation tags aren't applied to resources that were created before the tag was activated.
- The maximum active tag keys for Billing and Cost Management reports is 500.
- AWS generated tags are created using CloudTrail logs. CloudTrail logs over a certain size cause AWS generated tag creation to fail.
- The reserved prefix is `aws:`.

AWS generated tag names and values are automatically assigned the `aws:` prefix, which you can't assign. AWS generated tag names don't count towards the user-defined resource tag limit of 50. User-defined tag names have the prefix `user:` in the cost allocation report.

- Null tag values will not appear in Cost Explorer and AWS Budgets. If there is only one tag value that is also null, the tag key will also not appear in Cost Explorer or AWS Budgets.

**User-Defined Cost Allocation Tags**

User-defined tags are tags that you define, create, and apply to resources. After you have created and applied the user-defined tags, you can activate by using the Billing and Cost Management console for cost allocation tracking. Cost Allocation Tags appear on the console after you've enabled Cost Explorer, Budgets, AWS Cost and Usage Reports, or legacy reports. After you activate the AWS services, they appear on your cost allocation report. You can then use the tags on your cost allocation report to track your AWS costs. Tags are not applied to resources that were created before the tags were created.

**Note**

- As a best practice, do not include sensitive information in tags.
• Only a management account in an organization and single accounts that aren’t members of an organization have access to the Cost Allocation Tags manager in the Billing and Cost Management console.

Applying User-Defined Cost Allocation Tags

For ease of use and best results, use the AWS Tag Editor to create and apply user-defined tags. The Tag Editor provides a central, unified way to create and manage your user-defined tags. For more information, see Working with Tag Editor in the AWS Resource Groups User Guide.

For supported services, you can also apply tags to resources using the API or the AWS Management Console. Each AWS service has its own implementation of tags. You can work with these implementations individually or use Tag Editor to simplify the process. For a full list of services that support tags, see Supported Resources for Tag-based Groups and Resource Groups Tagging API Reference.

After you create and apply user-defined tags, you can activate them for cost allocation. If you activate your tags for cost allocation, it’s a good idea to devise a set of tag keys that represent how you want to organize your costs. Your cost allocation report displays the tag keys as additional columns with the applicable values for each row, so it’s easier to track your costs if you use a consistent set of tag keys.

Some services launch other AWS resources that the service uses, such as Amazon EMR launching an EC2 instance. If the supporting service (EC2) supports tagging, you can tag the supporting resources (such as the associated Amazon EC2 instance) for your report. For a full list of resources that can be tagged, use the Tag Editor to search. For more information about how to search for resources using Tag Editor, see Searching for Resources to Tag.

Note
AWS Marketplace line items are tagged with the associated Amazon EC2 instance tag.

Activating User-Defined Cost Allocation Tags

For tags to appear on your billing reports, you must activate your applied tags in the Billing and Cost Management console.

To activate your tags

2. In the navigation pane, choose Cost Allocation Tags.
3. Select the tags that you want to activate.
4. Choose Activate.

It can take up to 24 hours for tags to activate.

For an example of how tags appear in your billing report with cost allocation tags, see Viewing a cost allocation report (p. 135).

User-Defined Tag Restrictions

For basic tag restrictions, see Tag Restrictions in the Amazon EC2 User Guide.

The following restrictions apply to user-defined tags for Cost Allocation:

• The reserved prefix is aws:.
AWS generated tag names and values are automatically assigned the `aws:` prefix, which you can't assign. User-defined tag names have the prefix `user:` in the cost allocation report.

- Use each key only once for each resource. If you attempt to use the same key twice on the same resource, your request will be rejected.
- In some services, you can tag a resource when you create it. For more information, see the documentation for the service where you want to tag resources.
- You can't backdate the application of a tag. This means that tags only start appearing on your cost allocation report after you apply them and don't appear on earlier reports.
- If you need characters outside of those listed in Tag Restrictions, you can apply standard base-64 encoding to your tag. Billing and Cost Management does not encode or decode your tag for you.
- User-defined tags on non-metered services can be activated (for example, Account Tagging). However, these tags will not populate in the Cost Management suite because these services are not metered.

### Monthly cost allocation report

The monthly cost allocation report lists the AWS usage for your account by product category and linked account user. The report contains the same line items as the detailed billing report (see the Cost and Usage Reports Guide) and additional columns for your tag keys. For more information, see the following topics.

**Topics**

- Setting up a monthly cost allocation report (p. 134)
- Getting an hourly cost allocation report (p. 135)
- Viewing a cost allocation report (p. 135)

### Setting up a monthly cost allocation report

By default, new tag keys that you add using the API or the AWS Management Console are automatically excluded from the cost allocation report. You can add them using the procedures described in this topic.

When you select tag keys to include in your cost allocation report, each key becomes an additional column that lists the value for each corresponding line item. Because you might use tags for more than just your cost allocation report (for example, tags for security or operational reasons), you can include or exclude individual tag keys for the report. This ensures that you're seeing meaningful billing information that helps organize your costs. A small number of consistent tag keys makes it easier to track your costs. For more information, see Viewing a cost allocation report (p. 135).

**Note**

AWS stores billing reports in an Amazon S3 bucket that you create and own. You can retrieve these reports from the bucket using the Amazon S3 API, AWS Management Console for Amazon S3, or the Amazon S3 command line interface (CLI). You can't download the cost allocation report from the Account Activity page of the Billing and Cost Management console.

**To set up the cost allocation report and activate tags**

2. Under Preferences in the navigation pane, choose Billing Preferences.
3. For Detailed Billing Reports [Legacy], select the check box Turn on the legacy Detailed Billing Reports feature to receive ongoing reports of your AWS charges.
4. For Save to S3 Bucket, enter a valid Amazon S3 bucket name and choose Verify.
5. In the Report list, select the check box for Cost allocation report.
6. Choose **Manage report tags**, as shown in the following screenshot.

   The page displays a list of tags that you've created using either the API or the console for the applicable AWS service. Tag keys that currently appear in the report are selected, and the check boxes for excluded tag keys are cleared.

7. For **Filter**, choose **Inactive tags** in the dropdown list and select the tags that you want to activate for your report.

   ![Image of tag management interface](image)

8. Choose **Activate**.

   If you own the management account in an organization, your cost allocation report includes all the usage, costs, and tags for the member accounts. By default, all keys registered by member accounts are available for you to include or exclude from your report. The detailed billing report with resources and tags also includes any cost allocation tag keys that you select using the preceding steps.

**Getting an hourly cost allocation report**

The cost allocation report is one of several reports that AWS publishes to an Amazon S3 bucket several times a day.

   **Note**

   During the current billing period (monthly), AWS generates an estimated cost allocation report. The current month's file is overwritten throughout the billing period until a final report is generated at the end of the billing period. Then a new file is created for the next billing period. The reports for the previous months remain in the designated Amazon S3 bucket.

**Viewing a cost allocation report**

The following example tracks the charges for several cost centers and applications. Resources (such as Amazon EC2 instances and Amazon S3 buckets) are assigned tags like "Cost Center"="78925" and
"Application"="Widget1". In the cost allocation report, the user-defined tag keys have the prefix `user`, such as `user:Cost Center` and `user:Application`. AWS generated tag keys have the prefix `aws`. The keys are column headings identifying each tagged line item's value, such as `"78925"`.

You can use a desktop spreadsheet application to create pivot tables that group the keys and the values for each key so that you can see combined values for tagged resources. The following example organizes information first by Cost Center and, within each cost center further organizes the information by the Application tag.

<table>
<thead>
<tr>
<th>Cost Center</th>
<th>Usage</th>
<th>Before Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>78925</td>
<td>6236961</td>
<td>$1,008.28</td>
</tr>
<tr>
<td>Widget1</td>
<td>2255</td>
<td>$240.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widget2</td>
<td>36337395</td>
<td>$90.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AmazonEC2</td>
<td>72160</td>
<td>$10.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AmazonRDS</td>
<td>36146062</td>
<td>$79.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AmazonRDS</td>
<td>36140859</td>
<td>$3.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AmazonRDS</td>
<td>1673</td>
<td>$334.68</td>
</tr>
</tbody>
</table>

Pick your keys carefully so that you have a consistent hierarchy of values. Otherwise, your report won't group costs effectively, and you will have many line items.

**Note**

If you add or change the tags on a resource partway through a billing period, costs are split into two separate lines in your cost allocation report. The first line shows costs before the update, and the second line shows costs after the update.

**Unallocated resources in your report**

Any charges that cannot be grouped by tags in your cost allocation report default to the standard billing aggregation (organized by Account/Product/Line Item) and are included in your report. Situations where you can have unallocated costs include:

- You signed up for a cost allocation report mid-month.
- Some resources aren't tagged for part, or all, of the billing period.
- You are using services that currently don't support tagging.
• Subscription-based charges, such as Premium Support and AWS Marketplace monthly fees, can't be allocated.
• One-time fees, such as Amazon EC2 Reserved Instance upfront charges, can't be allocated.

Unexpected costs associated with tagged resources

You can use cost allocation tags to see what resources are contributing to your usage and costs, but deleting or deactivating the resources doesn't always reduce your costs. For more information on reducing unexpected costs, see Avoiding unexpected charges (p. 151).

Using the AWS Price List API

The Price List Service API (AKA the Query API) and AWS Price List API (AKA the Bulk API) enable you to query for the prices of AWS services using either JSON (with the Price List Service API) or HTML (with the AWS Price List API). You can also subscribe to Amazon Simple Notification Service (Amazon SNS) notifications to get alerts when prices for the services change. AWS prices change periodically, such as when AWS cuts prices, when new instance types are launched, or when new services are introduced.

Topics
• Using the query API (p. 137)
• Using the bulk API (p. 138)
• Setting up notifications (p. 148)

Using the query API

AWS Price List Service API is a centralized and convenient way to programmatically query AWS for services, products, and pricing information. The Price List Service API uses standardized product attributes such as Location, Storage Class, and Operating System, and provides prices at the SKU level. You can use Price List Service to build cost control and scenario planning tools, reconcile billing data, forecast future spend for budgeting purposes, and provide cost benefit analyses that compare your internal workloads with AWS. The query API does not support Savings Plans prices.

If you use a programming language that AWS provides an SDK for, we recommend that you use the SDK. All of the AWS SDKs greatly simplify the process of signing requests and save you a significant amount of time when compared with using the Price List Service API. In addition, the SDKs integrate easily with your development environment and provide easy access to related commands.

Note
The Price List Service API provides pricing details for your information only. If there is a discrepancy between the offer file and a service pricing page, AWS charges the prices that are listed on the service pricing page. For more information about AWS service pricing, see Cloud Services Pricing.

For more information about available SDKs, see Tools for Amazon Web Services. For more information about the AWS Price List Service API, see the AWS Billing and Cost Management API Reference.

Service endpoint

AWS Price List Service API provides the following two endpoints:

• https://api.pricing.us-east-1.amazonaws.com
Granting IAM permissions to use the AWS Price List Service API

An IAM user must be granted explicit permission to query the AWS Price List Service API. For the policy that grants the necessary permissions to an IAM user, see Find products and prices (p. 186).

Using the bulk API

The AWS Price List API is actually a URL that provides up-to-date pricing information on the current AWS products and services. To access pricing information using the AWS Price List API, download the offer file:

- **Offer file** – A JSON or CSV file that lists the products and prices for either a single AWS service in all Regions or a single AWS service in a specific Region. For more information, see Downloading an offer file (p. 139).

To find a list of all available offer files, download the offer index file:

- **Offer index file** – A JSON file that lists the supported AWS services, with a URL for each offer file where you can download pricing details. The file also includes metadata about the offer index file itself, URLs for service offer files, and URLs for regional offer index files. For more information, see Downloading an offer index file (p. 138).

Offer files don’t include information about expiring free tier offers or Amazon EC2 Spot Instances.

**Note**

The AWS Price List API provides pricing details for your information only. If there is a discrepancy between the offer file and a service pricing page, AWS charges the prices that are listed on the service pricing page. For more information about AWS service pricing, see Cloud Services Pricing.

Topics

- Downloading an offer index file (p. 138)
- Downloading an offer file (p. 139)
- Finding prices in an offer file (p. 139)
- Finding Savings Plan prices in an offer file (p. 142)
- Reading an offer file (p. 142)
- Reading the offer index file (p. 146)

To receive SNS notifications when prices change, see Setting up notifications (p. 148).

**Downloading an offer index file**

To download the offer index file, go to the following URL:

```
https://pricing.us-east-1.amazonaws.com/offers/v1.0/aws/index.json
```

The URL opens the offer index file. In the offer index file, search for the service that you want prices for. You need the service code to download the service-specific offer file. To download an offer index file for a specific service and Region, find the service that you want prices for and open the regional offer index file.
For more information, see Reading the offer index file (p. 146).

Downloading an offer file

To download the offer file for the service that you want, go to the URL for that offer file. For example, to download the current JSON version of the Amazon EC2 offer file, go to the following URL:

https://pricing.us-east-1.amazonaws.com/offers/v1.0/aws/AmazonEC2/current/index.json

The offer index file includes the JSON URLs. To download the CSV version, replace the .json extension in the offer file URL with .csv. If you want to download the offer file for a specific service and you know the service code, replace the AmazonEC2 in the URL with the service code to download the offer file for that service. If you don't know the service code, download the offer index file to find it. If you want to download the offer file for a specific service in a specific Region and you know the service code and Region, use the URL for that regional offer file. For example, to download the current JSON version of the Amazon EC2 offer file for US East (N. Virginia), use the following URL:

https://pricing.us-east-1.amazonaws.com/offers/v1.0/aws/AmazonEC2/current/us-east-1/index.json

To download the offer file for Savings Plans that apply to a particular service, go to the Savings Plans URL for that service. For example, to download the current JSON version of Compute Savings Plans, use the following URL. You can use this URL for the regional offer files directly.

https://pricing.us-east-1.amazonaws.com/savingsPlan/v1.0/aws/AWSComputeSavingsPlan/current/index.json

If you access the offer files programmatically, you can use the offer index file to find the current URLs. For more information about the offer index file, see Finding prices in an offer file (p. 139), Finding Savings Plan prices in an offer file (p. 142), and Reading an offer file (p. 142).

Finding prices in an offer file

The Price List Service API provides prices for all AWS products for informational purposes, including On-Demand and Reserved Instance pricing.

You can use the offer files to find the prices and terms for a specific product. For example, you can find a list of Amazon EC2 instance prices.

Note
The Price List Service API is not a comprehensive source for limited period Free Tiers, such as AWS Free Tier pricing. For complete information on Free Tier prices, see AWS Free Tier.

Use the following procedures to find prices for the products you're interested in.

Topics
- Finding On-Demand prices for services (p. 139)
- Finding tiered prices for services (p. 140)
- Finding tiered prices for services with free tier (p. 140)
- Finding prices for services with reserved instances (p. 141)

Finding On-Demand prices for services

The following procedure shows how to find On-Demand prices for services (for example, Amazon EC2).
To find an On-Demand price using the csv file
1. Download the csv file for the service.
2. Open the csv file with your program of choice.
3. Under the TermType column, filter to show OnDemand.
4. Find the usage type and operation of your choice.
5. In the PricePerUnit column, see the corresponding price.

To find an On-Demand price using the JSON file
1. Download the JSON file for the service.
2. Open the JSON file with your program of choice.
3. Under terms and On-Demand, find the SKU of interest.
   If you don't know the SKU, search under products for the usage type and operation.
4. See the pricePerUnit to find the corresponding On-Demand price for the SKU.

Finding tiered prices for services

The following procedure shows how to find tiered prices for services (for example, Amazon S3).

To find tiered prices for services using the csv file
1. Download the csv file for the service.
2. Open the csv file with your program of choice.
3. Under the TermType column, filter to show OnDemand.
4. Find the usage type and operation of your choice.
5. In the PricePerUnit column, see the corresponding price for each StartingRange and EndingRange.

To find tiered prices for services using the JSON file
1. Download the JSON file.
2. Open the JSON file with your program of choice.
3. Under terms and On-Demand find the SKU of interest.
   If you don't know the SKU, search under products for the usage type and operation.
4. Under each beginRange and endRange, see the pricePerUnit to find the corresponding tiered prices.

Finding tiered prices for services with free tier

The following procedure shows how to find AWS services that publish free tier prices in the Price List Service API (for example, AWS Lambda).

All Free Tier prices are subject to the terms documented in AWS Free Tier.

To find prices for services with free tier using csv
1. Download the csv file for the service.
2. Open the csv file with your program of choice.
3. Under the TermType column, filter to show OnDemand.
4. Under the **Location** column, filter to show **Any**.

   **Any** does not represent all AWS Regions in this scenario. It is a subset of Regions defined by other line items in the csv file, with a **RelatedTo** column matching the SKU for the location **Any** entry.

5. To find a list of all eligible locations and products for a given Free Tier SKU, find the Free Tier SKU under the **RelatedTo** column.

6. To find the covered usage by Free Tier across all eligible locations, see the **StartingRange** and **EndingRange** for the location **Any**.

**Example**

This example assumes there are no more entries in the price file where **RelatedTo** equals to the SKU ABCD.

The free tier offer with SKU ABCD is valid in Regions Asia Pacific (Singapore) and US East (Ohio), but not in AWS GovCloud (US). The covered usage by Free Tier is 400,000 seconds total, used across both eligible Regions.

<table>
<thead>
<tr>
<th>SKU</th>
<th>StartingRange</th>
<th>EndingRange</th>
<th>Unit</th>
<th>RelatedTo</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCD</td>
<td>0</td>
<td>400000</td>
<td>seconds</td>
<td>ABCD</td>
<td>Any</td>
</tr>
<tr>
<td>QWER</td>
<td>0</td>
<td>Inf</td>
<td>seconds</td>
<td>ABCD</td>
<td>Asia Pacific (Singapore)</td>
</tr>
<tr>
<td>WERT</td>
<td>0</td>
<td>Inf</td>
<td>seconds</td>
<td>ABCD</td>
<td>US East (Ohio)</td>
</tr>
<tr>
<td>ERTY</td>
<td>0</td>
<td>Inf</td>
<td>seconds</td>
<td>ABCD</td>
<td>AWS GovCloud (US)</td>
</tr>
</tbody>
</table>

**To find tiered prices for services with free tier using the JSON file**

1. Download the JSON file for the service.
2. Open the JSON file with your program of choice.
3. Under **products**, find the **usagetype** with the Region prefix **Global**.
4. Take note of the SKU and look for the same SKU under **terms** and **OnDemand**.
5. For the amount of Free Tier usage, see the **BeginRange** and **EndRange**.

   For a list of products and Regions covered by Free Tier, see **appliesTo**.

**Finding prices for services with reserved instances**

The following procedure shows how to find prices for services with Reserved Instances (for example, Amazon RDS).

**To find an Reserved Instance using the csv file**

1. Download the EC2 csv file for the service.
2. Open the csv file with your program of choice.
3. Under the **TermType** column, filter to show **reserved**.
4. Find the usage type and operation of your choice.
5. For each **LeaseContractLength**, **PurchaseOption**, and **OfferingClass**, see the **PricePerUnit** column for the corresponding price.

**To find an prices for Reserved Instance using the JSON file**

1. Download the JSON file for the service.
2. Open the JSON file with your program of choice.
3. Under **terms** and **Reserved**, find the SKU of interest.

   If you don't know the SKU, search under **products** for the **usage type** and **operation**.

You can find prices for all **LeaseContractLength**, **PurchaseOption**, and **OfferingClass** for the same product.

**Finding Savings Plan prices in an offer file**

You can use the offer files to find prices and discounts when Savings Plans are applied to your usage.

The following procedures show how to find Amazon EC2, Fargate, or AWS Lambda products by downloading a Savings Plans CSV or JSON file.

**To find Savings Plans for a service**

1. Download the index file.
2. Navigate to your relevant service.
3. Search for **savingsPlanVersionIndexUrl** to find Savings Plans rates that apply to the service.

   **Note**
   Some services might not have Savings Plans that apply.

**To find Savings Plans rates for a service**

1. Download the Savings Plans index file.
2. Find the relevant **regionalIndexURLs** for the Regions.

   The Compute Savings Plans that apply across multiple Regions will be in the **global** Region.
3. Download the Savings Plans offer file.

   - **Terms** includes the contract length and rates for all available Savings Plans.
   - **Rates** lists all SKUs that are covered by Savings Plans along with the applicable rate. Details of these SKUs are available in the individual service files. For example, Amazon EC2, Fargate, and AWS Lambda.

Files are available in both CSV and JSON format.

**Reading an offer file**

An offer file lists the products and prices for a single AWS service in all Regions or a single AWS service in a specific Region. Offer files are available as either CSV or JSON files. You can read the files in multiple ways, such as using a spreadsheet program to read and sort the CSV file, a text program to read the file, or a program that parses JSON.
Offer files include the following types of information:

- **Offer file details** – File metadata about the offer file itself, such as the format version and the publication date.
- **Product details** – Product metadata that lists the products in an offer file along with product information.
- **Pricing details (terms)** – Prices for all the products in this offer file.

**Note**

In a CSV file, the product and pricing details are combined into one section. In a JSON file, the product details and pricing details are in separate sections.

**Topics**

- CSV file (p. 143)
- JSON file (p. 143)
- Offer file definitions (p. 144)

**CSV file**

The first five rows of the CSV are the metadata for the offer file. The sixth row has all the column names for the products and their attributes, such as the SKU, the `OfferTermCode`, the `RateCode`, the `TermType`, and more. The number of columns varies depending on the service. The first 12 columns contain all the pricing details, while the other columns contain the product details for a service.

**JSON file**

In the JSON files, the product details and pricing details are in separate sections. The same product can be offered under multiple terms, and the same term could apply to multiple products. For example, an EC2 instance is available for an **Hourly** or **Reserved** term. Use the SKU of a product to identify the terms that are available for that product.

A JSON offer file looks like this:

```json
{
"formatVersion": "The version of the file format",
"disclaimer": "The disclaimers for the offer file",
"offerCode": "The code for the service",
"version": "The version of the offer file",
"publicationDate": "The publication date of the offer file",
"Products (p. 145)": {
  "sku": {
    "sku": "The SKU of the product",
    "productFamily": "The product family of the product",
    "attributes": {
      "attributeName": "attributeValue",
    }
  }
},
"Terms (p. 145)": {
  "termType": {
    "sku": {
      "offerTermCode": "The term code of the product",
      "sku": "The SKU of the product",
      "effectiveDate": "The effective date of the pricing details",
      "termAttributesType": "The attribute type of the terms",
      "termAttributes": {
        "attributeName": "attributeValue",
      }
    }
  }
}
```
Offer file definitions

Each of the sections in an offer file includes specific details about that product:

- **Offer file details** – File metadata about the offer file itself, such as the format version and the publication date.
- **Product details** – Product metadata that lists the products in an offer file along with product information.
- **Pricing details (terms)** – Prices for all the products in this offer file.

**Note**

In a CSV file, the product and pricing details are combined into one section. In a JSON file, the product details and pricing details are in separate sections.

The following lists provide definitions for each detail.

**Offer file details**

This section provides metadata about the offer file itself.

**Format Version**

An attribute that tracks which format version the offer file is in. The `formatVersion` of the file is updated when the structure is changed. For example, the version will change from v1 to v2.

**Disclaimer**

Any disclaimers that apply to the offer file.

**Offer Code**

A unique code for the product of an AWS service. For example, `AmazonEC2` for Amazon EC2 or `AmazonS3` for Amazon S3.

**Version**

An attribute that tracks the version of the offer file. Each time a new file is published, it contains a new version number. For example, `20150409T022205` and `20150910T182105`.

**Publication Date**

The date and time (UTC) when an offer file was published. For example, `2015-04-09T22:05Z`, `2015-09-10T18:21:05Z`. 
Product details

This section provides information about products in an AWS service offer file. Products are indexed by SKU.

Product Details:SKU

A unique code for a product. Use the SKU code to correlate product details and pricing. For example, a product with a SKU of HCNSHWWAJSGVAHMH is available only for a price that also lists HCNSHWWAJSGVAHMH as a SKU.

Product Details:SKU:Product Family

The category for the type of product. For example, compute for Amazon EC2 or storage for Amazon S3.

Product Details:SKU:Attributes

A list of all of the product attributes.

Product Details:SKU:Attributes:Attribute Name

The name of a product attribute. For example, Instance Type, Processor, or OS.

Product Details:SKU:Attributes:Attribute Value

The value of a product attribute. For example, m1.small (an instance type), xen (a type of processor), or Linux (a type of OS).

Pricing details (terms)

This section provides information about the prices for products in an AWS service offer file. Prices are indexed first by the terms (onDemand and reserved), and then by SKU.

Pricing Details:Term Type

The specific type of term that a term definition describes. The valid term types are reserved and onDemand.

Pricing Details:Term Type:SKU

A unique code for a product. Use the SKU code to correlate product details and pricing. For example, a product with a SKU of HCNSHWWAJSGVAHMH is available only for a price that also lists HCNSHWWAJSGVAHMH as a SKU.

Pricing Details:Term Type:SKU:Offer Term Code

A unique code for a specific type of term. For example, KCAKZHGHG. Product and price combinations are referenced by the SKU code followed by the term code, separated by a period. For example, U7ADXS4BEK5XXHRU.KCAKZHGHG.

Pricing Details:Term Type:SKU:Effective Date

The date that an offer file goes into effect. For example, if a term has an EffectiveDate of November 1, 2017, the price is not valid before November 1, 2017.

Pricing Details:Term Type:SKU:Term Attributes Type

A unique code for identifying what product and product offering are covered by a term. For example, an EC2-Reserved attribute type means that a term is available for EC2 reserved hosts.

Pricing Details:Term Type:SKU:Term Attributes

A list all of the attributes that are applicable to a term type, in the format attribute-name: attribute-value. For example, length of term and type of purchase covered by the term.
Pricing Details: Term Type: SKU: Term Attributes: Attribute Name

The name of a TermAttribute. You can use it to look up specific attributes. For example, you can look up terms by length or PurchaseOption.

Pricing Details: Term Type: SKU: Term Attributes: Attribute Value

The value of a TermAttribute. For example, terms can have a length of one year and a purchase option of All Upfront.

Pricing Details: Term Type: SKU: Price Dimensions

The pricing details for the offer file, such as how usage is measured, the currency that you can use to pay with, and the pricing tier limitations.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code

A unique code for a product/offer/pricing-tier combination. Product and term combinations can have multiple price dimensions, such as a free tier, a low use tier, and a high use tier.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Description

The description for a price or rate.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Unit

The type of unit that each service uses to measure usage for billing. For example, EC2 uses hours as a measuring unit, and S3 uses GB as a measuring unit.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Starting Range

The lower limit of the price tier covered by this price. For example, 0 GB or 1,001 API calls.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Ending Range

The upper limit of the price tier covered by this price. For example, 1,000 GB or 10,000 API calls.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Price Per Unit

A calculation of how much a single measured unit for a service costs.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Price Per Unit: Currency Code

A code that indicates the currency for prices for a specific product.

Pricing Details: Term Type: SKU: Price Dimensions: Rate Code: Price Per Unit: Currency Rate

The rate for a product in various supported currencies. For example, $1.2536 per unit.

Reading the offer index file

After you have the offer index file, you can use it to find an offer file.

Topics

- Offer index file (p. 146)
- Offer index definitions (p. 147)

Offer index file

The offer index file is available as a JSON file. You can read the file multiple ways, such as using a text program to read the JSON file or a program that parses the JSON.

The offer index file consists of two main sections: the metadata about the offer index file itself, and either a list of the services that AWS offers (for the offer index file) or a list of Regions where a service is
offered (for the regional offer index file). The information about an offer file includes the URL where you can download the prices and a URL for a regional offer index file for that service.

The offer index file looks like this:

```json
{
  "formatVersion":"The version number for the offer index format",
  "disclaimer": "The disclaimers for this offer index",
  "publicationDate": "The publication date of this offer index",
  "offers": {
    "firstService": {
      "offerCode": "The service that this price list is for",
      "currentVersionUrl": "The URL for this offer file",
      "currentRegionIndexUrl": "The URL for the regional offer index file",
      "savingsPlanVersionIndexUrl": "The URL for the Savings Plan index file (if applicable)"
    },
    "secondService": {
      "offerCode": ...
    }
  }
}
```

### Offer index definitions

The following list defines the terms that are used in the offer index file:

**FormatVersion**

An attribute that tracks which format version the offer index file is in. The `formatVersion` of the file is updated when the structure is changed. For example, the version will change from v1 to v2.

**Disclaimer**

Any disclaimers that apply to the offer index file.

**PublicationDate**

The date and time (UTC) when an offer index file was published. For example, 2015-04-09T02:22:05Z, 2015-09-10T18:21:05Z.

**Offers**

A list of available offer files.

**Offers:OfferCode**

A unique code for the product of an AWS service. For example, AmazonEC2 or AmazonS3. The `OfferCode` is used as the lookup key for the index.

**Offers:CurrentVersionUrl**

The URL where you can download the most up-to-date offer file.

**Offers:currentRegionIndexUrl**

A list of available regional offer files.

**Offers:savingsPlanVersionIndexUrl**

The list of applicable Savings Plan offers.
Setting up notifications

You can sign up to receive notifications when AWS prices change, such as when AWS cuts prices, when new instance types are launched, or when new services are introduced. You can sign up to be notified every time a price changes or once a day. If you sign up to be notified once a day, the notification includes all price changes applied during that day.

You can use the console to sign up for Amazon SNS notifications.

To sign up for price update notifications

2. If you are new to Amazon SNS, choose Get Started.
3. If necessary, change the Region on the navigation bar to US East (N. Virginia).
4. On the navigation pane, choose Subscriptions.
5. Choose Create Subscription.
6. For Topic ARN, do the following as appropriate:
   - For service pricing – If you want to be notified every time a price changes, enter arn:aws:sns:us-east-1:278350005181:price-list-api. If you want to be notified about price changes once a day, enter arn:aws:sns:us-east-1:278350005181:daily-aggregated-price-list-api instead.
7. For Protocol, use the default HTTP setting.
8. For Endpoint, choose the format that you want to receive the notification in, such as Amazon SQS, Lambda, or email.
9. Choose Create Subscription.

Important
If you get an error message Couldn't create subscription. Error code: InvalidParameter - Error message: Invalid parameter: TopicArn, it's likely that your Region is not set to US East (N. Virginia). The billing metric data is stored in this Region, even for resources in other Regions. Repeat the process with close attention to step 3.

Logging Billing and Cost Management API calls with AWS CloudTrail

Billing and Cost Management is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in Billing and Cost Management. CloudTrail captures API calls for Billing and Cost Management as events, including calls from the Billing and Cost Management console and from code calls to the Billing and Cost Management APIs. For a full list of CloudTrail events related to Billing, see Billing CloudTrail events (p. 149).

If you create a trail, you can enable continuous delivery of CloudTrail events to an Amazon S3 bucket, including events for Billing and Cost Management. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in Event history. Using the information collected by CloudTrail, you can determine the request that was made to Billing and Cost Management, the IP address from which the request was made, who made the request, when it was made, and additional details.
To learn more about CloudTrail, including how to configure and enable it, see the AWS CloudTrail User Guide.

**Billing CloudTrail events**

This section shows a full list of the CloudTrail events related to Billing and Cost Management.

<table>
<thead>
<tr>
<th>Event name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SetContactAddress</td>
<td>Logs the creation, deletion, or update of the account owner address.</td>
</tr>
<tr>
<td>SetFxPaymentCurrency</td>
<td>Logs the creation, deletion, or update of the preferred currency used to pay your invoice.</td>
</tr>
<tr>
<td>SetAdditionalContacts</td>
<td>Logs the creation, deletion, or update of the alternate contacts for billing, operations, and security communications.</td>
</tr>
<tr>
<td>SetSecurityQuestions</td>
<td>Logs the creation, deletion, or update of the security challenge questions to help AWS identify you as the owner of the account.</td>
</tr>
<tr>
<td>SetIAMAccessPreference</td>
<td>Logs the creation, deletion, or update of the IAM user's ability to access to the billing console. This setting is only for customers with root access.</td>
</tr>
<tr>
<td>SetAccountContractMetadata</td>
<td>Logs the creation, deletion, or update of the necessary contract information for public sector customers.</td>
</tr>
<tr>
<td>CloseAccount</td>
<td>Logs the closing of an account.</td>
</tr>
<tr>
<td>AcceptFxPaymentCurrencyTermsAndConditions</td>
<td>Logs the acceptance of the terms and conditions of paying in a currency other than USD.</td>
</tr>
<tr>
<td>SetTaxRegistration</td>
<td>Logs the creation, deletion, or update of the tax registration number for an account.</td>
</tr>
<tr>
<td>SetPayInformation</td>
<td>Logs the payment method history (invoice or credit/debit card) for the account.</td>
</tr>
<tr>
<td>RedeemPromoCode</td>
<td>Logs the redemption of promotional credits for an account.</td>
</tr>
<tr>
<td>SetCostExplorerPreferences</td>
<td>Logs the opt-in history of AWS Cost Explorer for the account.</td>
</tr>
<tr>
<td>CreateOrigamiReportPreferences</td>
<td>Logs the creation of the cost and usage report; management account only.</td>
</tr>
<tr>
<td>UpdateOrigamiReportPreferences</td>
<td>Logs the update of the cost and usage report; management account only.</td>
</tr>
<tr>
<td>DeleteOrigamiReportPreferences</td>
<td>Logs the deletion of the cost and usage report; management account only.</td>
</tr>
<tr>
<td>SetCreatedByOptIn</td>
<td>Logs the opt-in of the awscreatedby cost allocation tag preference.</td>
</tr>
<tr>
<td>SetTagKeysState</td>
<td>Logs the active or inactive state of a particular cost allocation tag.</td>
</tr>
<tr>
<td>SetRISharing</td>
<td>Logs the history of the RI/Savings Plans sharing preference for the management account.</td>
</tr>
<tr>
<td>SetCreditSharing</td>
<td>Logs the history of the credit sharing preference for the management account.</td>
</tr>
<tr>
<td>SetAccountPreferences</td>
<td>Logs the updates of the account name, email, and password.</td>
</tr>
<tr>
<td>EnableBillingAlerts</td>
<td>Logs the opt-in of receiving CloudWatch billing alerts for estimated charges.</td>
</tr>
</tbody>
</table>
Billing and Cost Management information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When supported event activity occurs in Billing and Cost Management, that activity is recorded in a CloudTrail event along with other AWS service events in Event history. You can view, search, and download recent events in your AWS account. For more information, see Viewing Events with CloudTrail Event History in the AWS CloudTrail User Guide.

For an ongoing record of events in your AWS account, including events for Billing and Cost Management, create a trail. A trail enables CloudTrail to deliver log files to an Amazon S3 bucket. By default, when you create a trail in the console, the trail applies to all AWS Regions. The trail logs events from all Regions in the AWS partition and delivers the log files to the Amazon S3 bucket that you specify. Additionally, you can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs.

For more information, see the following:
- Overview for Creating a Trail
- CloudTrail Supported Services and Integrations
- Configuring Amazon SNS Notifications for CloudTrail
- Receiving CloudTrail Log Files from Multiple Regions and Receiving CloudTrail Log Files from Multiple Accounts

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or IAM user credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another AWS service.

For more information, see the CloudTrail userIdentity Element in the AWS CloudTrail User Guide.

Example: Billing and Cost Management log file entries

A trail is a configuration that enables delivery of events as log files to an Amazon S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files are not an ordered stack trace of the public API calls, so they don't appear in any specific order.

The following example shows a CloudTrail log entry that demonstrates the SetContactAddress action.

```json
{
    "eventVersion": "1.05",
    ...
}
```
Avoiding unexpected charges

Here are some suggestions to help you avoid unexpected charges on your bill. The first two items are for those who use the one-year AWS Free Tier. The next items address specific features or behaviors within individual services from AWS that can sometimes result in unexpected charges, particularly if you unsubscribe from the service or close your account.

**Note**

If you close your account or unsubscribe from a service, make sure that you take the appropriate steps for every region in which you’ve allocated AWS resources.

**Topics**

- Usage exceeds AWS Free Tier (p. 152)
- AWS Free Tier expired (p. 152)
- Bill received after account closure (p. 152)
- Disabled regions (p. 152)
- Elastic Beanstalk environments (p. 152)
- Elastic Load Balancing (ELB) (p. 152)
- Services started in AWS OpsWorks (p. 152)
- Amazon EC2 instances (p. 153)
- Amazon Elastic Block Store volumes and snapshots (p. 153)
- Elastic IP addresses (p. 154)
- Services launched by other services (p. 154)
- Storage services (p. 154)
Usage exceeds AWS Free Tier

If you use the free tier, make sure that your usage does not exceed the limits that are specified at AWS Free Tier. You are charged On-Demand Instance rates for any usage that exceeds the free tier limits. You can check your AWS Free Tier usage alerts and your free tier usage alerts on the Billing and Cost Management console.

**Note**

Free tier usage alerts are available only to the management account in an organization. They aren't available for individual member accounts in an organization.

For more information about tracking your free tier usage, see Tracking your AWS Free Tier usage (p. 24).

AWS Free Tier expired

If you receive unexpected charges after a period of inactivity, your free tier period might have expired. Any resources that are allocated to your account after your free tier period expires begin to incur charges. To check for resources in use, open the AWS Management Console. Be sure to check each Region where you have allocated resources.

For more information about free tier offerings and terms, see AWS Free Tier.

Bill received after account closure

Each month’s usage is calculated and billed at the beginning of the following month. If you close your account but use opt-in services during the month, you receive a bill for the opt-in service usage at the beginning of the following month.

Disabled regions

If you disable a Region and you still have resources in that Region, you continue to incur charges for those resources. (There is no charge for enabling a Region, only charges for the resources that you create in a Region.) For more information, see Enabling and disabling regions (p. 12).

Elastic Beanstalk environments

Elastic Beanstalk is designed to ensure that all the resources that you need are running, which means that it automatically relaunches any services that you stop. To avoid this, you must terminate your Elastic Beanstalk environment before you terminate resources that Elastic Beanstalk has created. For more information, see Terminating an Environment in the AWS Elastic Beanstalk Developer Guide.

Elastic Load Balancing (ELB)

Like Elastic Beanstalk environments, ELB load balancers are designed to keep a minimum number of Amazon Elastic Compute Cloud (Amazon EC2) instances running. You must terminate your load balancer before you delete the Amazon EC2 instances that are registered with it. For more information, see Delete Your Load Balancer in the Elastic Load Balancing User Guide.

Services started in AWS OpsWorks

If you use the AWS OpsWorks environment to create AWS resources, you must use AWS OpsWorks to terminate those resources or AWS OpsWorks restarts them. For example, if you use AWS OpsWorks to create an Amazon EC2 instance, but then terminate it by using the Amazon EC2 console, the AWS OpsWorks auto healing feature categorizes the instance as failed and restarts it. For more information, see AWS OpsWorks User Guide.
Amazon EC2 instances

After you remove load balancers and Elastic Load Balancing environments, you can stop or terminate Amazon EC2 instances. Stopping an instance allows you to start it again later, but you might be charged for storage. Terminating an instance permanently deletes it. For more information, see Instance Lifecycle in the Amazon EC2 User Guide for Linux Instances, particularly Stop and Start Your Instance and Terminate Your Instance.

Note
Amazon EC2 instances serve as the foundation for multiple AWS services. They can appear in the Amazon EC2 console Instances list even if they were started by other services. For example, Amazon Relational Database Service (Amazon RDS) instances run on Amazon EC2 instances. If you terminate an underlying Amazon EC2 instance, the service that started it might interpret the termination as a failure and restart the instance. For example, the AWS OpsWorks service has a feature called auto healing that restarts resources when it detects failures. In general, it is a best practice to delete resources through the services that started them.

Additionally, if you create Amazon EC2 instances from an Amazon Machine Image (AMI) that is backed by an instance store, check Amazon S3 for the related bundle. Deregistering an AMI does not delete the bundle. For more information, see Deregistering Your AMI.

Amazon Elastic Block Store volumes and snapshots

Most Amazon EC2 instances are configured so that their associated Amazon EBS volumes are deleted when they are terminated, but it is possible to set up an instance that preserves its volume and the data. Check the Volumes pane in the Amazon EC2 console for volumes that you don’t need anymore. For more information, see Deleting an Amazon EBS Volume in the Amazon EC2 User Guide for Linux Instances.

If you have stored snapshots of your Amazon EBS volumes and no longer need them, you should delete them as well. Deleting a volume does not automatically delete the associated snapshots.

For more information about deleting snapshots, see Deleting an Amazon EBS Snapshot.

Note
Deleting a snapshot might not reduce your organization's data storage costs. Other snapshots might reference that snapshot's data, and referenced data is always preserved. For example, when you take the first snapshot of a volume with 10 GiB of data, the size of the snapshot is also 10 GiB. Because snapshots are incremental, the second snapshot that you take of the same volume contains only blocks of data that changed since the first snapshot was taken. The second snapshot also references the data in the first snapshot. That is, if you modify 4 GiB of data and take a second snapshot, the size of the second snapshot is 4 GiB. In addition, the second snapshot references the unchanged 6 GiB in the first snapshot. For more information, see How Incremental Snapshots Work.

The previous example will show two entries in your daily AWS Cost and Usage Reports (AWS CUR). AWS CUR captures the snapshot usage amount for a single day. In this example, the usage is 0.33 GiB (10 GiB/30 days) for snap-A, and 0.1333 GiB (4 GiB/30 days) for snap-B. Using the rate of $0.05 per GB/month, snap-A costs you 0.33 GiB x $0.05 = $0.0165. Snap-B costs you 0.133 GiB x $0.05 = $0.0066, and you are charged $0.0231 per day for both snapshots. For more information about AWS Cost and Usage Reports, see the AWS Cost and Usage Reports user guide.

<table>
<thead>
<tr>
<th>lineItem/Operation</th>
<th>lineItem/ResourceId</th>
<th>lineItem/UsageAmount</th>
<th>lineItem/UnblendedCost</th>
<th>resourceTags/user:usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CreateSnapshot</td>
<td>arn:aws:ec2:us-east-1:123:snapshot/snap-A</td>
<td>0.33</td>
<td>0.0165</td>
<td>dev</td>
</tr>
</tbody>
</table>
If you delete the first snapshot (snap-A in the first row of the preceding table), any data that is referenced by the second snapshot (snap-B in the second row of the preceding table) is preserved. Remember that the second snapshot contains the 4 GiB of incremental data, and references 6 GiB from the first snapshot. Once you delete snap-A, the size of snap-B becomes 10 GiB (4 changed GiB from the snap-B and 6 unchanged GiB from snap-A).

In your daily AWS CUR, you will then see the usage amount for snap-B as 0.33 GiB (10 GiB/30 days), charged at $0.0165 per day. When you delete a snapshot, the charges for the remaining snapshots are recalculated daily, resulting in the possibility that the cost for each snapshot can change daily as well. For more information, see Cost Allocation for EBS Snapshots.

### Elastic IP addresses

Any Elastic IP addresses that are attached to an instance that you terminate are unattached, but they are still allocated to you. If you don’t need that IP address anymore, release it to avoid additional charges. For more information, see Releasing an Elastic IP Address in the Amazon EC2 User Guide for Linux Instances.

### Services launched by other services

A number of AWS services can launch resources, so be sure to check for anything that might have launched through any service that you’ve used.

### Storage services

When you are minimizing costs for AWS resources, keep in mind that many services might incur storage costs, such as Amazon RDS and Amazon S3.
Consolidated billing for AWS Organizations

You can use the consolidated billing feature in AWS Organizations to consolidate billing and payment for multiple AWS accounts or multiple Amazon Internet Services Pvt. Ltd (AISPL) accounts. Every organization in AWS Organizations has a management account that pays the charges of all the member accounts. For more information about organizations, see the AWS Organizations User Guide.

Consolidated billing has the following benefits:

- **One bill** – You get one bill for multiple accounts.
- **Easy tracking** – You can track the charges across multiple accounts and download the combined cost and usage data.
- **Combined usage** – You can combine the usage across all accounts in the organization to share the volume pricing discounts, Reserved Instance discounts, and Savings Plans. This can result in a lower charge for your project, department, or company than with individual standalone accounts. For more information, see Volume discounts (p. 158).
- **No extra fee** – Consolidated billing is offered at no additional cost.

**Note**
The member account bills are for informational purpose only. The management account might reallocate the additional volume discounts, Reserved Instance, or Savings Plans discounts that your account receives.

If you have access to the management account, you can see a combined view of the AWS charges that the member accounts incur. You also can get a cost report for each member account.

AWS and AISPL accounts can't be consolidated together. If your contact address is in India, you can use AWS Organizations to consolidate AISPL accounts within your organization.

**Important**
When a member account leaves an organization, the member account can no longer access Cost Explorer data that was generated when the account was in the organization. The data isn't deleted, and the management account in the organization can still access the data. If the member account rejoins the organization, the member account can access the data again.

**Topics**
- Consolidated billing process (p. 156)
- Consolidated billing in India (p. 157)
- Effective billing date (p. 157)
- Billing and account activity (p. 157)
- Volume discounts (p. 158)
- AWS credits (p. 159)
- Reserved instances (p. 160)
- Understanding Consolidated Bills (p. 163)
Consolidated billing process

AWS Organizations provides consolidated billing so that you can track the combined costs of all the member accounts in your organization. The following steps provide an overview of the process for creating an organization and viewing your consolidated bill.

1. Open the AWS Organizations console or the AWS Billing and Cost Management console. If you open the AWS Billing and Cost Management console, choose Consolidated Billing, and then choose Get started. You are redirected to the AWS Organizations console.
2. Choose Create organization on the AWS Organizations console.
3. Create an organization from the account that you want to be the management account of your new organization. For details, see Creating an Organization. The management account is responsible for paying the charges of all the member accounts.
4. (Optional) Create accounts that are automatically member to the organization. For details, see Creating an AWS Account in Your Organization.
5. (Optional) Invite existing accounts to join your organization. For details, see Inviting an AWS Account to Join Your Organization.
6. Each month AWS charges your management account for all the member accounts in a consolidated bill. The following illustration shows an example of a consolidated bill.

The management account is billed for all charges of the member accounts. However, unless the organization is changed to support all features in the organization (not consolidated billing features only) and member accounts are explicitly restricted by policies, each member account is otherwise independent from the other member accounts. For example, the owner of a member account can sign up for AWS services, access resources, and use AWS Premium Support unless the management account restricts those actions. Each account owner continues to use their own IAM user name and password, with account permissions assigned independently of other accounts in the organization.
Securing the consolidated billing management account

The owner of the management account in an organization should secure the account by using AWS Multi-Factor Authentication and a strong password that has a minimum of eight characters with both uppercase and lowercase letters, at least one digit, and at least one special character. You can change your password on the AWS Security Credentials page.

Consolidated billing in India

If you sign up for a new account and choose India for your contact address, your user agreement is with Amazon Internet Services Pvt. Ltd (AISPL), a local AWS seller in India. AISPL manages your billing, and your invoice total is listed in rupees instead of in dollars. After you create an account with AISPL, you can't change the country in your contact information.

If you have an existing account with an India address, your account is either with AWS or AISPL, depending on when you opened the account. To learn whether your account is with AWS or AISPL, see the procedure Determining Which Company Your Account Is With. If you're an existing AWS customer, you can continue to use your AWS account. You can also choose to have both an AWS account and an AISPL account, although they can't be consolidated into the same organization. (Currently, you can't migrate an existing account from AWS to AISPL.) If you are in an AISPL organization, the management account can edit the PAN numbers of all member accounts.

If you create an organization from a management account that is with AISPL, you can invite only other AISPL accounts to join your organization. You can't invite AWS accounts.

If you create an organization from a management account that is with AWS, you can invite only other AWS accounts to join your organization. You can't invite AISPL accounts.

Effective billing date

When the member account owner accepts your request to join the organization, you immediately become responsible for the member account's charges. If the member account joins in the middle of the month, the management account is billed only for the latter part of the month. The member account's original owner is still billed for the first part of the month, as shown in the following diagram.

 Billing and account activity

Each month, AWS charges the management account owner, and not the owners of the member accounts. To see the total usage and charges across all the accounts in an organization, see the Bills page of
the management account. AWS updates the page multiple times each day. Additionally, AWS makes a downloadable cost report available each day.

Although the owners of the member accounts aren't charged, they can still see their usage and charges by going to their AWS Bills pages. They can't view or obtain data for the management account or any other member accounts on the bill.

**Volume discounts**

For billing purposes, AWS treats all of the accounts in the organization as if they were one account. Some services, such as AWS Data Transfer and Amazon S3, have volume pricing tiers across certain usage dimensions that give you lower prices the more you use the service. With consolidated billing, AWS combines the usage from all accounts to determine which volume pricing tiers to apply, giving you a lower overall price whenever possible. AWS then allocates each member account a portion of the overall volume discount based on the account's usage.

The Bills page for each member account displays an average tiered rate that is calculated across all the accounts on the consolidated bill for the organization. For example, let's say that Bob's consolidated bill includes both Bob's own account and Susan's account. Bob's account is the management account, so he pays the charges for both himself and Susan.

As shown in the following illustration, Bob transfers 8 TB of data during the month and Susan transfers 4 TB.

For the purposes of this example, AWS charges $0.17 per GB for the first 10 TB of data transferred and $0.13 for the next 40 TB. This translates into $174.08 per TB (= .17*1024) for the first 10 TB, and $133.12 per TB (= .13*1024) for the next 40 TB. Remember that 1 TB = 1024 GB.

For the 12 TB that Bob and Susan used, Bob's management account is charged ($174.08 * 10 TB) + ($133.12 * 2 TB) = $1740.80 + $266.24 = $2,007.04.

Without the benefit of tiering across the consolidated bill, AWS would have charged Bob and Susan each $174.08 per TB for their usage, for a total of $2,088.96.

To learn more about pricing, see AWS Pricing.

**AWS Free Tier for AWS Organizations**

For services such as Amazon EC2 that support a free tier, AWS applies the free tier to the total usage across all accounts in an AWS organization. AWS doesn't apply the free tier to each account individually.

AWS provides budgets that track whether you exceed the free tier limits or are forecasted to go over the free tier limits. Free tier budgets are not enabled for organizations by default. Management account can opt in to free tier usage alerts through the Billing and Cost Management console. Free tier usage alerts aren't available to individual member accounts.
For more information about free tiers, see AWS Free Usage Tier FAQs. For more information about AWS Free Tier usage alerts through AWS Budgets and opting in, see AWS Free Tier usage alerts using AWS Budgets (p. 24).

AWS credits

AWS credits are applied to bills to help cover costs that are associated with eligible services. For more information about eligible services, see Redeem Your AWS Promotional Credit. Credits are applied until they are exhausted or they expire.

- Applying AWS credits (p. 159)
- Applying AWS credits across single and multiple accounts (p. 159)
- Sharing AWS credits (p. 160)

Applying AWS credits

AWS applies credits in the following order:

1. Soonest expiring
2. Least number of applicable products
3. Oldest credit

AWS applies the credit to the largest available charge across all eligible sellers of record. This means that AWS tries to apply your credits before they expire even if they use a more generic credit for a specific service.

For example, Jorge has two credits available to him. Credit one is for 10 dollars, expires January 2019, and can be used for either Amazon S3 or Amazon EC2. Credit two is for 5 dollars, expires December 2019, and can be used only for Amazon EC2. Jorge has two AWS charges: 100 dollars for Amazon EC2 and 50 dollars for Amazon S3. AWS applies credit one, which expires in January, to the Amazon EC2 charge, which leaves him with a 90-dollar Amazon EC2 charge and a 50-dollar Amazon S3 charge. AWS applies credit two to the remaining 90 dollars of Amazon EC2 usage, and Jorge has to pay 85 dollars for Amazon EC2 and 50 dollars for Amazon S3. All his credits are now exhausted.

Applying AWS credits across single and multiple accounts

The following rules specify how AWS applies credits to bills for single accounts and for organizations:

- The billing cycle begins on the first day of each month.
- If an account is owned on the first day of the month by an individual who is not part of an organization but who later in the month joins one, AWS applies credits to that individual's bill for their usage from the first day of the month until the day that they join the organization.
- If an account is owned on the first day of the month by an organization, AWS applies credits redeemed by the management account or by any member account to the organization's bill.
- If an individual leaves an organization during the month, AWS begins applying credits to the single account on the first day of the following month.

For example, assume that Susan owns a single account on the first of the month and then joins an organization during the month. Also assume that she redeems her credits on any day after she joins the
organization. AWS applies her credits to her account for usage she incurred from the first of the month to the day that she joined the organization. However, from the first of the following month onward, AWS applies the credits to the organization's bill. If Susan leaves the organization, any credits that she redeems are also applied to the organization's bill until the first of the month after her departure. On that day, AWS again applies Susan's credits to her bill.

If you're more comfortable with numbers, assume that Susan owns a single account on January 1 and joins an organization on January 11. If Susan redeems 100 dollars of credits on January 18, AWS applies them to her account for the usage that she incurred from January 1 to January 11. From February onward, Susan's credits are applied to the organization's consolidated bill. If Susan has 50 dollars of credits and leaves the organization on April 16, her credits are applied to the organization's consolidated bill for April. From May onward, Susan's credits are applied to her account.

Sharing AWS credits

You can turn off credit sharing on the Billing Preferences page on the Billing and Cost Management console. The following rules specify how credits are applied to bills for single accounts and for organizations when credit sharing is turned off:

- The billing cycle begins on the first day of each month.
- Credits are applied to only the account that received the credits.
- Bills are calculated using the credit sharing preference that is active on the last day of the month.
- In an organization, only the management account can turn credit sharing off or on. The credit sharing preference applies to all accounts in an organization.

To turn off credit sharing

You can turn off credit sharing through the Billing and Cost Management console.

2. In the navigation pane, choose Billing Preferences.
3. Select Disable credit sharing.
4. Choose Save preferences.

Reserved instances

For billing purposes, the consolidated billing feature of AWS Organizations treats all the accounts in the organization as one account. This means that all accounts in the organization can receive the hourly cost benefit of Reserved Instances that are purchased by any other account.

You can turn off Reserved Instance discount sharing on the Preferences page on the Billing and Cost Management console. For more information, see the section called “Turning off reserved instances and Savings Plans discount sharing” (p. 162).

Topics

- Billing examples for specific services (p. 160)
- Turning off reserved instances and Savings Plans discount sharing (p. 162)

Billing examples for specific services

There are a few other things to know about how consolidated billing works with specific services in AWS.
Amazon EC2 reserved instances

For an Amazon EC2 Reserved Instances example, suppose that Bob and Susan each have an account in an organization. Susan has five Reserved Instances of the same type, and Bob has none. During one particular hour, Susan uses three instances and Bob uses six, for a total of nine instances on the organization's consolidated bill. AWS bills five instances as Reserved Instances, and the remaining four instances as regular instances.

Bob receives the cost benefit from Susan's Reserved Instances only if he launches his instances in the same Availability Zone where Susan purchased her Reserved Instances. For example, if Susan specifies us-west-2a when she purchases her Reserved Instances, Bob must specify us-west-2a when he launches his instances to get the cost benefit on the organization's consolidated bill. However, the actual locations of Availability Zones are independent from one account to another. For example, the us-west-2a Availability Zone for Bob's account might be in a different location than the location for Susan's account.

Amazon RDS reserved DB instances

For an Amazon RDS Reserved DB Instances example, suppose that Bob and Susan each have an account in an organization. Susan has five Reserved DB Instances, and Bob has none. During one particular hour, Susan uses three DB Instances and Bob uses six, for a total of nine DB Instances on the consolidated bill. AWS bills five as Reserved DB Instances, and the remaining four as On-Demand DB Instances (for Amazon RDS Reserved DB Instance charges, see the pricing page). Bob receives the cost benefit from Susan's Reserved DB Instances only if he launches his DB Instances in the same region where Susan purchased her Reserved DB Instances.

Also, all of the relevant attributes of Susan's Reserved DB Instances should match the attributes of the DB Instances launched by Bob as described in Reserved DB Instances. For example, let's say Susan purchased a Reserved DB Instance in us-west-2 with the following attributes:

- DB Engine: Oracle
- DB Instance Class: m1.xlarge
- Deployment Type: Multi-AZ

This means that Bob must launch his DB Instances in us-west-2 with the exact same attributes to get the cost benefit on the organization's consolidated bill.

Amazon ElastiCache reserved node instances

For an Amazon ElastiCache Reserved Nodes example, suppose Bob and Susan each have an account in an organization. Susan has five Reserved Nodes, and Bob has none. During one particular hour, Susan uses three nodes and Bob uses six. This makes a total of nine nodes used on the consolidated bill.

AWS bills five as Reserved Nodes. AWS bills the remaining four as On-Demand nodes. (For Amazon ElastiCache Reserved Nodes charges, see Amazon ElastiCache Pricing.) Bob receives the cost benefit from Susan's Reserved Nodes only if he launches his On-Demand nodes in the same region where Susan purchased her Reserved Nodes.

Also, to receive the cost benefit of Susan’s Reserved Nodes, all attributes of Bob's nodes must match the attributes of the nodes launched by Susan. For example, let's say Susan purchased Reserved Nodes in us-west-2 with the following attributes:

- Cache engine: Redis
- Node type: cache.r3.large
Bob must launch his ElastiCache nodes in \texttt{us-west-2} with the same attributes to get the cost benefit on the organization's consolidated bill.

**Amazon Elasticsearch Service reserved instances**

For an Amazon Elasticsearch Service Reserved Nodes example, suppose Bob and Susan each have an account in an organization. Susan has five Reserved Instances, and Bob has none. During one particular hour, Susan uses three instances and Bob uses six. This makes a total of nine instances used on the consolidated bill.

AWS bills five as Reserved Instances. AWS bills the remaining four as On-Demand instances. (For Amazon Elasticsearch Service Reserved Instance charges, see Amazon Elasticsearch Service Pricing.) Bob receives the cost benefit from Susan's Reserved Instances only if he launches his On-Demand instances in the same region where Susan purchased her Reserved Instances.

To receive the cost benefit of Susan's Reserved Instances, Bob also must use the same instance type that Susan reserved. For example, let's say Susan purchased \texttt{m4.large.elasticsearch} instances in \texttt{us-west-2}. Bob must launch his Amazon Elasticsearch Service domains in \texttt{us-west-2} with the same instance type to get the cost benefit on the organization's consolidated bill.

**Turning off reserved instances and Savings Plans discount sharing**

The management account of an organization can turn off Reserved Instance (RI) discount and Savings Plans discount sharing for any accounts in that organization, including the management account. This means that RIs and Savings Plans discounts aren't shared between any accounts that have sharing turned off. To share an RI or Savings Plans discount with an account, both accounts must have sharing turned on. This preference isn't permanent, and you can change it at any time. Each estimated bill is computed using the last set of preferences. The final bill for the month is calculated based on the preferences set at 23:59:59 UTC time on the last day of the month.

**Important**

Turning off RI and sharing can result in a higher monthly bill.

**Topics**

- Turning off shared reserved instances and Savings Plans discounts (p. 162)
- Turning on shared reserved instances and Savings Plans discounts (p. 163)

**Turning off shared reserved instances and Savings Plans discounts**

You can turn off RI sharing discounts for individual member accounts.

You can't share Savings Plans with a set of accounts. You can choose to restrict the benefit to the account that purchased the Savings Plans, but not share amongst a group of accounts.

**To turn off shared reserved instances and Savings Plans discounts**

2. In the navigation pane, choose Billing preferences.
3. Expand RI and Savings Plans discount sharing by selecting the arrow symbol.
4. Under RI and Savings Plans discount sharing enabled, select the accounts that you want to disable RI discount sharing for.
5. Choose Add to list to add the accounts to the RI and Savings Plans discount sharing disabled accounts.
6. Choose Save preferences.
7. In the Manage RI Discount, Savings Plans Discount and Credit Sharing dialog box, choose Save.

Turning on shared reserved instances and Savings Plans discounts

You can use the console to turn RI sharing discounts back on for an account.

You can't share Savings Plans with a set of accounts. You can choose to restrict the benefit to the account that purchased the Savings Plans, but not share amongst a group of accounts.

To turn on shared reserved instances discounts

2. In the navigation pane, choose Billing Preferences.
3. Expand RI and Savings Plans discount sharing by selecting the arrow symbol.
4. Under RI and Savings Plans discount sharing disabled, select the accounts that you want to enable RI discount sharing for.
5. Choose Remove from list to remove the accounts from the RI and Savings Plans discount sharing disabled accounts.
6. Choose Save preferences.
7. In the Manage RI Discount and Credit Sharing dialog box, choose Save.

Understanding Consolidated Bills

If you manage an organization in AWS Organizations, you can use consolidated billing to view aggregated usage costs for accounts in the organization. Consolidated billing can also help you reduce those costs. For example, to ensure that you pay the lowest available prices for AWS products and services, AWS offers pricing tiers that reward higher usage with lower prices and discounted rates for purchasing instances in advance (known as reservations or Reserved Instances). Using consolidated billing, you can combine usage from multiple accounts into a single invoice, allowing you to reach the tiers with lower prices faster. You can also apply unused reservations from one account to another account's instance usage.

Topics
- Calculating Consolidated Bills (p. 163)
- Pricing Tiers (p. 164)
- Reserved Instances (p. 165)
- Savings Plans (p. 166)
- Blended Rates and Costs (p. 166)

Calculating Consolidated Bills

In an organization, the management account is responsible for paying all charges that the member accounts incur. If you're an administrator of a management account and you have the appropriate
permissions, you can view aggregated usage costs for Reserved Instance discounts and volume tiering for all member accounts. You can also view the charges that individual member accounts incur, because AWS creates a separate bill for each member account based on that account's usage. AWS also includes invoice summaries for each account in the management account invoice. During each billing period, AWS calculates your estimated charges several times each day so that you can track your costs as your organization incurs them. Your bill is not finalized until the beginning of the next month.

**Note**
Like member accounts, a management account can incur usage charges. However, as a best practice you shouldn't use the management account to run AWS services. An exception is for services and resources that are required to manage the organization itself. For example, as part of managing your consolidated billing you might create an S3 bucket in the management account to store AWS Cost and Usage reports.

**Pricing Tiers**

Some AWS services are priced in tiers, which specify unit costs for defined amounts of AWS usage. As your usage increases, your usage crosses thresholds into new pricing tiers that specify lower unit costs for additional usage in a month. Your AWS usage is measured every month. To measure usage, AWS treats all accounts in an organization as a single account. Member accounts don't reach tier thresholds individually. Instead, all usage in the organization is aggregated for each service, which ensures faster access to lower-priced tiers. As each month begins, your service usage is reset to zero.

Each AWS service publishes its pricing information independently. You can access all individual pricing pages from the AWS Pricing page.

**Calculating Costs for Amazon S3 Standard Storage**

The following table shows an example of pricing tiers (your costs might vary).

**Amazon S3 Pricing Tiers**

The following table shows Amazon S3 usage for an organization that includes a management account and three member accounts.

**Example S3 Usage Blended Cost**

<table>
<thead>
<tr>
<th>Account</th>
<th>Tier</th>
<th>Storage Amount (G)</th>
<th>Storage Amount (TB)</th>
<th>Unblended Rate (/GB)</th>
<th>Unblended Rate (/TB)</th>
<th>Unblended Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master</td>
<td>First TB/Month</td>
<td>1000 GB</td>
<td>1 TB</td>
<td>$0.10</td>
<td>100</td>
<td>$100.00</td>
</tr>
<tr>
<td></td>
<td>Next 49 TB/Month</td>
<td>49000 GB</td>
<td>49 TB</td>
<td>$0.08</td>
<td>80</td>
<td>$3,920.00</td>
</tr>
<tr>
<td></td>
<td>Next 450 TB/Month</td>
<td>45000 GB</td>
<td>45 TB</td>
<td>$0.06</td>
<td>60</td>
<td>$2,700.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>95000 GB</td>
<td>95 TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member 1</td>
<td>First TB/Month</td>
<td>1000 GB</td>
<td>1 TB</td>
<td>$0.10</td>
<td>100</td>
<td>$100.00</td>
</tr>
<tr>
<td></td>
<td>Next 49 TB/Month</td>
<td>14000 GB</td>
<td>14 TB</td>
<td>$0.08</td>
<td>80</td>
<td>$1,120.00</td>
</tr>
<tr>
<td></td>
<td>Next 450 TB/Month</td>
<td>15000 GB</td>
<td>15 TB</td>
<td>$0.06</td>
<td>60</td>
<td>$900.00</td>
</tr>
<tr>
<td>Member 2</td>
<td>Next 49 TB/Month</td>
<td>20000 GB</td>
<td>20 TB</td>
<td>$0.08</td>
<td>80</td>
<td>$1,600.00</td>
</tr>
<tr>
<td></td>
<td>Next 450 TB/Month</td>
<td>15000 GB</td>
<td>15 TB</td>
<td>$0.06</td>
<td>60</td>
<td>$900.00</td>
</tr>
<tr>
<td>Member 3</td>
<td>Next 49 TB/Month</td>
<td>15000 GB</td>
<td>15 TB</td>
<td>$0.08</td>
<td>80</td>
<td>$1,200.00</td>
</tr>
<tr>
<td></td>
<td>Next 450 TB/Month</td>
<td>15000 GB</td>
<td>15TB</td>
<td>$0.06</td>
<td>60</td>
<td>$900.00</td>
</tr>
</tbody>
</table>

The costs in the preceding table are calculated as follows:
1. All usage for the organization adds up to 95 TB or 95,000 GB. This is rolled up into the management account for recording purposes. The management account has no usage of its own. Only the member accounts incur usage. Member 1 uses 1 TB of storage. This satisfies the first pricing tier for the organization. The second pricing tier is satisfied by all three member accounts (14 TB for member 1 + 20 TB for member 2 + 15 TB for member 3 = 49 TB). The third pricing tier is applied to any usage over 49 TB. In this example, the third pricing tier is applied to total member account usage of 45 TB.

2. The total cost is calculated by adding the cost of the first TB (1,000 GB * $0.10 = 1 TB * $100.00 = $100.00) to the cost of the next 49 TB (49,000 GB * $0.08 = 49 TB * $80.00 = $3920.00) and the cost of the remaining 45 TB (45,000 GB * $0.06 = 45 TB * $60.00 = $2700.00), for a total of $6,720 ($100.00 + $3920.00 + $2700.00 = $6720.00).

The preceding example shows how using consolidated billing in AWS Organizations helps lower the overall monthly cost of storage. If you calculate the cost for each member account separately, the total cost is $6,780 rather than $6,720. By aggregating the usage of the three accounts, you reach the lower-priced tiers sooner. The most expensive storage, the first TB, is charged at the highest price just once, rather than three times. For example, three TB of storage at the most expensive rate of $100/TB would result in a charge of $300. Charging this storage as 1 TB ($100) and two additional TB at $80 ($160) results in a total charge of $260.

Reserved Instances

AWS also offers discounted hourly rates in exchange for an upfront fee and term contract.

Zonal Reserved Instances

A Reserved Instance is a reservation that provides a discounted hourly rate in exchange for an upfront fee and term contract. Services such as Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Relational Database Service (Amazon RDS) use this approach to sell reserved capacity for hourly use of Reserved Instances. It is not a virtual machine. It is a commitment to pay in advance for specific Amazon EC2 or Amazon RDS instances. In return, you get a discounted rate as compared to On-Demand Instance usage. From a technical perspective, there is no difference between a Reserved Instance and an On-Demand Instance. When you launch an instance, AWS checks for qualifying usage across all accounts in an organization that can be applied to an active reservation. For more information, see Reserved Instances in the Amazon EC2 User Guide for Linux Instances and Working with Reserved DB Instances in the Amazon Relational Database Service Developer Guide.

When you reserve capacity with Reserved Instances, your hourly usage is calculated at a discounted rate for instances of the same usage type in the same Availability Zone.

Regional Reserved Instances

Regional Reserved Instances don't reserve capacity. Instead, they provide Availability Zone flexibility and in certain cases instance size flexibility. Availability Zone flexibility allows you to run one or more instances in any Availability Zone in your reserved AWS Region. The Reserved Instance discount is applied to any usage in any Availability Zone. Instance size flexibility provides the Reserved Instance discount to instance usage regardless of size, within that instance family. Instance size flexibility applies to only regional Reserved Instances on the Linux/Unix platform with default tenancy. For more information about regional Reserved Instances, see see Reservation Details in the Cost and Usage Reports Guide in this documentation and Applying Reserved Instances in the Amazon Elastic Compute Cloud User Guide for Linux Instances.

Calculating Costs for Amazon EC2 with Reserved Instances

AWS calculates the charges for Amazon EC2 instances by aggregating all the EC2 usage for a specific instance type in a specific AWS Region for an organization.
Calculation Process

AWS calculates blended rates for Amazon EC2 instances using the following logic:

1. AWS aggregates usage for all accounts in an organization for the month or partial month, and calculates costs based on unblended rates such as rates for On-Demand and Reserved Instances. Line items for these costs are created for the management account. This bill computation model attempts to apply the lowest unblended rates that each line item is eligible for. The allocation logic first applies Reserved Instance hours, then free tier hours, and then On-Demand rates to any remaining usage. In the AWS Cost and Usage Reports, you can see line items for these aggregated costs.

2. AWS identifies each Amazon EC2 usage type in each AWS Region and allocates cost from the aggregated management account to the corresponding member account line items for identical usage types in the same region. In the AWS Cost and Usage Reports, the Unblended Rate column shows the rate applied to each line item.

**Note**

When AWS assigns Reserved Instance hours to member accounts, it always starts with the account that purchased the reservation. If there are hours from the capacity reservation left over, AWS applies them to other accounts that operate identical usage types in the same Availability Zone.

AWS allocates a regional RI by instance size: The RI is applied first to the smallest instance in the instance family, then to the next smallest, and so on. AWS applies an RI or a fraction of an RI based on the normalization factor of the instance. The order in which AWS applies RIs doesn't result in a price difference.

Savings Plans

Savings Plans is a flexible pricing model that can help you reduce your AWS usage bill. Compute Savings Plans enables you to commit to an amount each hour, and receive discounted Amazon EC2, Fargate, and AWS Lambda usage up to that amount.

Calculating Costs with Savings Plans

AWS calculates the charges for Amazon EC2, Fargate, and AWS Lambda by aggregating all usage that's not covered by Reserved Instances, and applying the Savings Plans rates starting with the highest discount.

The Savings Plans are applied to the account that owns the Savings Plans. Then, it is shared with other accounts in the AWS organization. For more information, see Understanding How Savings Plans are Applied to Your Usage in the Savings Plans User Guide.

Blended Rates and Costs

Blended rates are the averaged rates of the Reserved Instances and On-Demand Instances that are used by member accounts in an organization in AWS Organizations. AWS calculates blended costs by multiplying the blended rate for each service with an account's usage of that service.

**Note**

AWS shows each member account their charges as unblended costs. AWS continues to apply all of the consolidated billing benefits such as reservations and tiered prices across all member accounts in an AWS Organizations organization.

This section includes examples that show how AWS calculates blended rates for the following services.

- Calculating Blended Rates for Amazon S3 Standard Storage
Calculating Blended Rates for Amazon S3 Standard Storage

AWS calculates blended rates for Amazon S3 standard storage by taking the total cost of storage and dividing by the amount of data stored per month. Using the example from Calculating Consolidated Bills (p. 163) where we calculated a cost of $6,720 for a management account and three member accounts, we calculate the blended rates for the accounts using the following logic:

1. The blended rate in GB is calculated by dividing the total cost ($6,720) by the amount of storage (95,000 GB) to produce a blended rate of $0.070737/GB. The blended rate in TB is calculated by dividing the total cost ($6,720) by the amount of storage (95 TB) to produce a blended rate of $70.737/TB.

2. The blended cost for each member account is allocated by multiplying the blended rate (for GB or TB) by the usage, resulting in the amounts listed in the Blended Cost column. For example, Member 1 uses 14,000 GB of storage priced at the blended rate of $0.070737 (or 14 TB priced at $70.737) for a blended cost of $990.318.

Calculating Blended Rates for Amazon EC2

The following example shows how the consolidated billing logic aggregates Amazon EC2 costs to the management account and then allocates it to the member accounts based on proportional usage. For this example, all usage is of the same usage type, occurs in the same Availability Zone, and is for the same Reserved Instance term. This example covers Full Upfront and Partial Upfront Reserved Instances.

The following table shows line items that represent the calculation of line items for Amazon EC2 usage for a 720-hour (30-day) month. Each instance is of the same usage type (t2.small) running in the same Availability Zone. The organization has purchased three Reserved Instances for a one-year term. Member Account 1 has three Reserved Instances. Member Account 2 has no Reserved Instances, but uses an On-Demand Instance.

<table>
<thead>
<tr>
<th>Line Item Account</th>
<th>Billing Type</th>
<th>Usage Type</th>
<th>Upfront cost</th>
<th>Monthly cost</th>
<th>Usage available</th>
<th>Usage Quantity</th>
<th>Unblended Rate</th>
<th>Unblended Rate Upfront</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Account</td>
<td>RI, All upfront</td>
<td>t2.small</td>
<td>$274.00</td>
<td>$0.00</td>
<td></td>
<td>1440</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Account</td>
<td>RI, Partial upfront</td>
<td>t2.small</td>
<td>$70.00</td>
<td>$5.84</td>
<td></td>
<td>720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member Account 1</td>
<td>RI applied</td>
<td>t2.small</td>
<td>-</td>
<td>-</td>
<td>1440</td>
<td></td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Member Account 1</td>
<td>RI applied</td>
<td>t2.small</td>
<td>-</td>
<td>-</td>
<td>720</td>
<td></td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Member Account 2</td>
<td>On demand</td>
<td>t2.small</td>
<td>-</td>
<td>-</td>
<td>300</td>
<td></td>
<td>$0.023</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2160</td>
<td>2460</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The data in the preceding table shows the following information:

- The organization has purchased 1,440 hours of Reserved Instance capacity at a Full Upfront rate (two EC2 instances).
- The organization has purchased 720 hours of Reserved Instance capacity at a Partial Upfront rate (one EC2 instance).
- Member account 1 completely uses the two Full Upfront Reserved Instances and the one Partial Upfront Reserved Instance for a total usage of 2,160 hours. Member account 2 uses 300 hours of an On-Demand Instance. Total usage for the organization is 2,460 hours (2160 + 300 = 2,460).
- The unblended rate for the three Reserved Instances is $0.00. The unblended cost of an RI is always $0.00 because RI charges are not included in blended rate calculations.
- The unblended rate for the On-Demand Instance is $0.023. Unblended rates are associated with the current price of the product. They can't be verified from information in the preceding table.
- The blended rate is calculated by dividing the total cost ($6.90) by the total amount of Amazon EC2 usage (2460 hours). This produces a rate of $0.002804878 dollars per hour.
AWS Support charges for accounts in an AWS Organizations

AWS calculates AWS Support fees independently for each member account. Typically an AWS Support subscription for a member account does not apply to the entire organization. Each account subscribes independently. Enterprise Support plan customers have the option to include multiple accounts in an aggregated monthly billing. Monthly charges for the Developer, Business, and Enterprise Support plans are based on each month's AWS usage, subject to a monthly minimum. AWS Support fees associated with Reserved Instance and Savings Plan purchases apply to the member accounts that made the purchase. For more information, see AWS Support Plan Pricing.
Security in AWS Billing and Cost Management

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 Billing and Cost Management, 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.

This documentation helps you understand how to apply the shared responsibility model when using Billing and Cost Management. The following topics show you how to configure Billing and Cost Management to meet your security and compliance objectives. You also learn how to use other AWS services that help you to monitor and secure your Billing and Cost Management resources.

**Topics**

- Data protection in AWS Billing and Cost Management (p. 169)
- AWS Identity and Access Management for AWS Billing and Cost Management (p. 170)
- Logging and monitoring in AWS Billing and Cost Management (p. 193)
- Compliance validation for AWS Billing and Cost Management (p. 194)
- Resilience in AWS Billing and Cost Management (p. 194)
- Infrastructure security in AWS Billing and Cost Management (p. 195)

Data protection in AWS Billing and Cost Management

The AWS shared responsibility model applies to data protection in AWS Billing and Cost Management. 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 sensitive identifying information, such as your customers' account numbers, into free-form fields such as a Name field. This includes when you work with Billing and Cost Management or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into Billing and Cost Management or other services might get picked up for inclusion in diagnostic logs. When you provide a URL to an external server, don't include credentials information in the URL to validate your request to that server.

AWS Identity and Access Management for AWS Billing and Cost Management

AWS Identity and Access Management (IAM) is an AWS service that helps an administrator securely control access to AWS resources. IAM administrators control who can be authenticated (signed in) and authorized (have permissions) to use Billing and Cost Management resources. IAM is an AWS service that you can use with no additional charge.

To start activating access to the Billing console, first see Tutorial: Delegate Access to the Billing Console in the IAM User Guide.

Topics
- Audience (p. 170)
- Overview of managing access permissions (p. 172)
- Using identity-based policies (IAM policies) for Billing and Cost Management (p. 173)
- Billing and Cost Management policy examples (p. 181)

Audience

How you use IAM differs, depending on the work you do in Billing and Cost Management.

Service user – If you use the Billing and Cost Management service to do your job, then your administrator provides you with the credentials and permissions that you need. As you use more Billing and Cost Management features to do your work, you might need additional permissions. Understanding how access is managed can help you request the right permissions from your administrator.

Service administrator – If you're in charge of Billing and Cost Management resources at your company, you probably have full access to Billing and Cost Management. It's your job to determine which Billing
and Cost Management features and resources your employees should access. You must then submit requests to your IAM administrator to change the permissions of your service users. Review the information on this page to understand the basic concepts of IAM.

**IAM administrator** – If you’re an IAM administrator, you might want to learn details about how you can write policies to manage access to Billing and Cost Management.

This table summarizes the default actions that are permitted in Billing and Cost Management for each type of billing user.

### User types and billing permissions

<table>
<thead>
<tr>
<th>User type</th>
<th>Description</th>
<th>Billing permissions</th>
</tr>
</thead>
</table>
| Account owner                          | The person or entity in whose name your account is set up as.                                                                                                                                                 | • Has full control of all Billing and Cost Management resources.  
• Receives a monthly invoice of AWS charges.                                                                                                           |
| IAM user                               | A person or application defined as a user in an account by an account owner or administrative user. Accounts can contain multiple IAM users.                                                                     | • Has permissions explicitly granted to the user or a group that includes the user.  
• Can be granted permission to view Billing and Cost Management console pages.  
For more information, see Overview of managing access permissions (p. 172).  
• Can't close accounts.                                                                                                                                  |
| Organization management account owner  | The person or entity associated with an AWS Organizations management account. The management account pays for AWS usage that is incurred by a member account in an organization.                               | • Has full control of all Billing and Cost Management resources for the management account only.  
• Receives a monthly invoice of AWS charges for the management account and member accounts.  
• Views the activity of member accounts in the billing reports for the management account.                                                             |
| Organization member account owner      | The person or entity associated with an AWS Organizations member account. The management account pays for AWS usage that is incurred by a member account in an organization.                                    | • Doesn't have permission to review any usage reports or account activity except for its own. Doesn't have access to usage reports or account activity for other member accounts in the organization or for the management account.  
• Doesn't have permission to view billing reports.  
• Has permission to update account information only for its own account. Can't access                                                                 |
Overview of managing access permissions

AWS Billing and Cost Management integrates with the AWS Identity and Access Management (IAM) service so that you can control who in your organization has access to specific pages on the AWS Billing and Cost Management console. You can control access to invoices and detailed information about charges and account activity, budgets, payment methods, and credits.

For more information about how to activate access to the Billing Console, see Tutorial: Delegate Access to the Billing Console in the IAM User Guide.

Topics

- Granting access to your billing information and tools (p. 172)
- Activating access to the Billing and Cost Management console (p. 172)

Granting access to your billing information and tools

The AWS account owner can access billing information and tools by signing in to the AWS Management Console using the account password. We recommend that you don’t use the account password for everyday access to the account, and especially that you don’t share account credentials with others to give them access to your account.

Instead, you should create a special user identity called an IAM user for anyone who might need access to the account. This approach provides individual sign-in information for each user, and you can grant each user only the permissions they need to work with your account. For example, you can grant some users limited access to some of your billing information and tools, and grant others complete access to all of the information and tools. (We recommend that the account owner also access the account by using an IAM user identity.)

By default, IAM users do not have access to the AWS Billing and Cost Management console. You or your account administrator must grant users access. You can do this by activating IAM user access to the Billing and Cost Management console and attaching an IAM policy to your users. This can be either managed or custom. Then, you need to activate IAM user access for IAM policies to take effect. You only need to activate IAM user access once.

**Note**
IAM is a feature of your AWS account. If you are already signed up for a product that is integrated with IAM, you don’t need to do anything else to sign up for IAM, nor will you be charged for using it.
Permissions for Cost Explorer apply to all accounts and member accounts, regardless of IAM policies. For more information about Cost Explorer access, see Controlling access for Cost Explorer (p. 58).

Activating access to the Billing and Cost Management console

To be able to grant your IAM user and role access to your account’s Billing and Cost Management console, you must activate the functionality.

**Important**
When you activate IAM user access to the Billing and Cost Management console, you grant full access to all users who already have full access to the AWS APIs. You can restrict their access by...
applying an IAM policy that constrains their permissions. See Allow full access to AWS services but deny IAM users access to the Billing and Cost Management console (p. 183).

**To activate IAM user and role access to the Billing and Cost Management console**

1. Sign in to the AWS Management Console with your root account credentials (the email address and password that you used to create your AWS account).
2. On the navigation bar, choose your account name, and then choose My Account.
4. Select the Activate IAM Access check box to activate access to the Billing and Cost Management pages.
5. Choose Update.

You can now use IAM policies to control which pages a user can access.

After you have activated IAM user access, you can attach IAM policies to grant or deny access to specific billing features. For more information about using policies to grant IAM users access to Billing and Cost Management features, see Using identity-based policies (IAM policies) for Billing and Cost Management (p. 173).

**Using identity-based policies (IAM policies) for Billing and Cost Management**

This topic provides examples of identity-based policies that demonstrate how an account administrator can attach permissions policies to IAM identities (users, groups, and roles) and thereby grant permissions to perform operations on Billing and Cost Management resources.

For a full discussion of AWS accounts and IAM users, see What Is IAM? in the IAM User Guide.

For information on how you can update customer managed policies, see Editing customer managed policies (console) in the IAM User Guide.

**Topics**

- Billing and Cost Management actions policies (p. 173)
- Managed policies (p. 179)

**Billing and Cost Management actions policies**

This table summarizes the permissions that allow or deny IAM users access to your billing information and tools. For examples of policies that use these permissions, see Billing and Cost Management policy examples (p. 181).

<table>
<thead>
<tr>
<th>Permission name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aws-portal:ViewBilling</td>
<td>Allow or deny IAM users permission to view the Billing and Cost Management console pages.</td>
</tr>
<tr>
<td>aws-portal:ModifyBilling</td>
<td>Allow or deny IAM users permission to modify the following Billing and Cost Management console pages:</td>
</tr>
<tr>
<td></td>
<td>- Budgets</td>
</tr>
<tr>
<td></td>
<td>- Consolidated Billing</td>
</tr>
<tr>
<td></td>
<td>- Preferences</td>
</tr>
</tbody>
</table>

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### Using IAM policies for Billing and Cost Management

<table>
<thead>
<tr>
<th>Permission name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Credits</td>
<td>To allow IAM users to modify these console pages, you must allow both ModifyBilling and ViewBilling. For an example policy, see Allow IAM users to modify billing information (p. 184).</td>
</tr>
<tr>
<td>aws-portal:ViewAccount</td>
<td>Allow or deny IAM users permission to view the following Billing and Cost Management console pages:</td>
</tr>
<tr>
<td></td>
<td>• Billing Dashboard</td>
</tr>
<tr>
<td></td>
<td>• Account Settings</td>
</tr>
<tr>
<td>aws-portal:ModifyAccount</td>
<td>Allow or deny IAM users permission to modify Account Settings.</td>
</tr>
<tr>
<td></td>
<td>To allow IAM users to modify account settings, you must allow both ModifyAccount and ViewAccount.</td>
</tr>
<tr>
<td></td>
<td>For an example of a policy that explicitly denies an IAM user access to the <strong>Account Settings</strong> console page, see Deny access to account settings, but allow full access to all other billing and usage information (p. 185).</td>
</tr>
<tr>
<td>budgets:ViewBudget</td>
<td>Allow or deny IAM users permission to view Budgets.</td>
</tr>
<tr>
<td></td>
<td>To allow IAM users to view budgets, you must also allow ViewBilling.</td>
</tr>
<tr>
<td>budgets:ModifyBudget</td>
<td>Allow or deny IAM users permission to modify Budgets.</td>
</tr>
<tr>
<td></td>
<td>To allow IAM users to view and modify budgets, you must also allow ViewBilling.</td>
</tr>
<tr>
<td>aws-portal:ViewPaymentMethods</td>
<td>Allow or deny IAM users permission to view Payment Methods.</td>
</tr>
<tr>
<td>aws-portal:ModifyPaymentMethods</td>
<td>Allow or deny IAM users permission to modify Payment Methods.</td>
</tr>
<tr>
<td></td>
<td>To allow users to modify payment methods, you must allow both ModifyPaymentMethods and ViewPaymentMethods.</td>
</tr>
<tr>
<td>Permission name</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>cur:DescribeReportDefinitions</td>
<td>Allow or deny IAM users permission to view AWS Cost and Usage Reports. AWS Cost and Usage Reports permissions apply to all reports created using the AWS Cost and Usage Reports Service API and the Billing and Cost Management console. If you create reports using the Billing and Cost Management console, we recommend that you update the permissions for IAM users. Not updating the permissions will result in users losing access to viewing, editing, and removing reports on the console reports page. For an example of a policy, see Allow IAM users to access the reports console page (p. 183).</td>
</tr>
<tr>
<td>cur:PutReportDefinition</td>
<td>Allow or deny IAM users permission to create AWS Cost and Usage Reports. AWS Cost and Usage Reports permissions apply to all reports created using the AWS Cost and Usage Reports Service API and the Billing and Cost Management console. If you create reports using the Billing and Cost Management console, we recommend that you update the permissions for IAM users. Not updating the permissions will result in users losing access to viewing, editing, and removing reports on the console reports page. For an example of a policy, see Allow IAM users to access the reports console page (p. 183).</td>
</tr>
<tr>
<td>cur:DeleteReportDefinition</td>
<td>Allow or deny IAM users permission to delete AWS Cost and Usage Reports. AWS Cost and Usage Reports permissions apply to all reports created using the AWS Cost and Usage Reports Service API and the Billing and Cost Management console. If you create reports using the Billing and Cost Management console, we recommend that you update the permissions for IAM users. Not updating the permissions will result in users losing access to viewing, editing, and removing reports on the console reports page. For an example of a policy, see Create, view, edit, or delete AWS Cost and Usage Reports (p. 188).</td>
</tr>
<tr>
<td>Permission name</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>cur:ModifyReportDefinition</td>
<td>Allow or deny IAM users permission to modify AWS Cost and Usage Reports. AWS Cost and Usage Reports permissions apply to all reports created using the AWS Cost and Usage Reports Service API and the Billing and Cost Management console. If you create reports using the Billing and Cost Management console, we recommend that you update the permissions for IAM users. Not updating the permissions will result in users losing access to viewing, editing, and removing reports on the console reports page. For an example of a policy, see Create, view, edit, or delete AWS Cost and Usage Reports (p. 188).</td>
</tr>
<tr>
<td>ce:GetPreferences</td>
<td>Allow or deny IAM users permissions to view the Cost Explorer preferences page. For an example policy, see View and update the Cost Explorer preferences page.</td>
</tr>
<tr>
<td>ce:UpdatePreferences</td>
<td>Allow or deny IAM users permissions to update the Cost Explorer preferences page. For an example policy, see View and update the Cost Explorer preferences page.</td>
</tr>
<tr>
<td>ce:DescribeReport</td>
<td>Allow or deny IAM users permissions to view the Cost Explorer reports page. For an example policy, see View, create, update, and delete using the Cost Explorer reports page.</td>
</tr>
<tr>
<td>ce:CreateReport</td>
<td>Allow or deny IAM users permissions to create reports using the Cost Explorer reports page. For an example policy, see View, create, update, and delete using the Cost Explorer reports page.</td>
</tr>
<tr>
<td>ce:UpdateReport</td>
<td>Allow or deny IAM users permissions to update using the Cost Explorer reports page. For an example policy, see View, create, update, and delete using the Cost Explorer reports page.</td>
</tr>
<tr>
<td>ce:DeleteReport</td>
<td>Allow or deny IAM users permissions to delete reports using the Cost Explorer reports page. For an example policy, see View, create, update, and delete using the Cost Explorer reports page.</td>
</tr>
<tr>
<td>Permission name</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ce:DescribeNotificationSubscription</td>
<td>Allow or deny IAM users permissions to view Cost Explorer reservation expiration alerts in the reservation overview page. For an example policy, see <a href="#">View, create, update, and delete reservation expiration alerts</a>.</td>
</tr>
<tr>
<td>ce:CreateNotificationSubscription</td>
<td>Allow or deny IAM users permissions to create Cost Explorer reservation expiration alerts in the reservation overview page. For an example policy, see <a href="#">View, create, update, and delete reservation expiration alerts</a>.</td>
</tr>
<tr>
<td>ce:UpdateNotificationSubscription</td>
<td>Allow or deny IAM users permissions to update Cost Explorer reservation expiration alerts in the reservation overview page. For an example policy, see <a href="#">View, create, update, and delete reservation expiration alerts</a>.</td>
</tr>
<tr>
<td>ce:DeleteNotificationSubscription</td>
<td>Allow or deny IAM users permissions to delete Cost Explorer reservation expiration alerts in the reservation overview page. For an example policy, see <a href="#">View, create, update, and delete reservation expiration alerts</a>.</td>
</tr>
<tr>
<td>ce:CreateCostCategoryDefinition</td>
<td>Allow or deny IAM users permissions to create cost categories. For an example policy, see <a href="#">View and manage cost categories</a>.</td>
</tr>
<tr>
<td>ce:DeleteCostCategoryDefinition</td>
<td>Allow or deny IAM users permissions to delete cost categories. For an example policy, see <a href="#">View and manage cost categories</a>.</td>
</tr>
<tr>
<td>ce:DescribeCostCategoryDefinition</td>
<td>Allow or deny IAM users permissions to view cost categories. For an example policy, see <a href="#">View and manage cost categories</a>.</td>
</tr>
<tr>
<td>ce:ListCostCategoryDefinitions</td>
<td>Allow or deny IAM users permissions to list cost categories. For an example policy, see <a href="#">View and manage cost categories</a>.</td>
</tr>
<tr>
<td>ce:UpdateCostCategoryDefinition</td>
<td>Allow or deny IAM users permissions to update cost categories. For an example policy, see <a href="#">View and manage cost categories</a>.</td>
</tr>
<tr>
<td>Permission name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ce:CreateAnomalyMonitor</td>
<td>Allow or deny IAM users permissions to create a single anomaly detection (p. 117) monitor.</td>
</tr>
<tr>
<td>ce:GetAnomalyMonitors</td>
<td>Allow or deny IAM users permissions to view all anomaly detection (p. 117) monitors.</td>
</tr>
<tr>
<td>ce:UpdateAnomalyMonitor</td>
<td>Allow or deny IAM users permissions to update anomaly detection (p. 117) monitors.</td>
</tr>
<tr>
<td>ce:DeleteAnomalyMonitor</td>
<td>Allow or deny IAM users permissions to delete anomaly detection (p. 117) monitors.</td>
</tr>
<tr>
<td>ce:CreateAnomalySubscription</td>
<td>Allow or deny IAM users permissions to create a single subscription for anomaly detection (p. 117).</td>
</tr>
<tr>
<td>ce:GetAnomalySubscriptions</td>
<td>Allow or deny IAM users permissions to view all subscriptions for anomaly detection (p. 117).</td>
</tr>
<tr>
<td>ce:UpdateAnomalySubscription</td>
<td>Allow or deny IAM users permissions to update anomaly detection (p. 117) subscriptions.</td>
</tr>
<tr>
<td>ce:DeleteAnomalySubscription</td>
<td>Allow or deny IAM users permissions to delete anomaly detection (p. 117) subscriptions.</td>
</tr>
<tr>
<td>ce:GetAnomalies</td>
<td>Allow or deny IAM users permissions to view all anomalies in anomaly detection (p. 117).</td>
</tr>
<tr>
<td>ce:ProvideAnomalyFeedback</td>
<td>Allow or deny IAM users permissions to provide feedback on a detected anomaly detection (p. 117).</td>
</tr>
<tr>
<td>aws-portal:ViewUsage</td>
<td>Allow or deny IAM users permission to view AWS usage Reports.</td>
</tr>
<tr>
<td></td>
<td>To allow IAM users to view usage reports, you must allow both ViewUsage and ViewBilling.</td>
</tr>
<tr>
<td></td>
<td>For an example policy, see Allow IAM users to access the reports console page.</td>
</tr>
<tr>
<td>pricing:DescribeServices</td>
<td>Allow or deny IAM users permission to view AWS service products and pricing via the AWS Price List Service API.</td>
</tr>
<tr>
<td></td>
<td>To allow IAM users to use AWS Price List Service API, you must allow DescribeServices, GetAttributeValues, and GetProducts.</td>
</tr>
<tr>
<td></td>
<td>For an example policy, see Find products and prices.</td>
</tr>
</tbody>
</table>
### Permission name | Description
---|---
**pricing:GetAttributeValues** | Allow or deny IAM users permission to view AWS service products and pricing via the AWS Price List Service API. To allow IAM users to use AWS Price List Service API, you must allow DescribeServices, GetAttributeValues, and GetProducts. For an example policy, see [Find products and prices](#).
**pricing:GetProducts** | Allow or deny IAM users permission to view AWS service products and pricing via the AWS Price List Service API. To allow IAM users to use AWS Price List Service API, you must allow DescribeServices, GetAttributeValues, and GetProducts. For an example policy, see [Find products and prices](#).
**purchase-orders:ViewPurchaseOrders** | Allow or deny IAM users permission to view Purchase Orders ([p. 48](#)). For an example policy, see [View and manage purchase orders](#).
**purchase-orders:ModifyPurchaseOrders** | Allow or deny IAM users permission to modify Purchase Orders ([p. 48](#)). For an example policy, see [View and manage purchase orders](#).

### Managed policies
Managed policies are standalone identity-based policies that you can attach to multiple users, groups, and roles in your AWS account. You can use AWS managed policies to control access in Billing and Cost Management.

An AWS managed policy is a standalone policy that is created and administered by AWS. AWS managed policies are designed to provide permissions for many common use cases. AWS managed policies make it easier for you to assign appropriate permissions to users, groups, and roles than if you had to write the policies yourself.

You can't change the permissions defined in AWS managed policies. AWS occasionally updates the permissions defined in an AWS managed policy. When this occurs, the update affects all principal entities (users, groups, and roles) that the policy is attached to.

Billing and Cost Management provides several AWS managed policies for common use cases.

**Topics**
- Allows full access to AWS Budgets including budgets actions ([p. 180](#))
- Allows AWS Budgets broad permission to control AWS resources ([p. 180](#))
Allows full access to AWS Budgets including budgets actions

Managed policy name: AWSBudgetsActionsWithAWSResourceControlAccess

This managed policy is focused on the user, ensuring that you have the proper permissions to grant permission to AWS Budgets to execute the defined actions. This policy provides full access to AWS Budgets, including budgets actions, to retrieve the status of your policies and run AWS resources using the AWS Management Console.

```json
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "budgets:*"
         ],
         "Resource": "*"
      },
      {
         "Effect": "Allow",
         "Action": [
            "aws-portal:ViewBilling"
         ],
         "Resource": "*"
      },
      {
         "Effect": "Allow",
         "Action": [
            "iam:PassRole"
         ],
         "Resource": "*",
         "Condition": {
            "StringEquals": {
               "iam:PassedToService": "budgets.amazonaws.com"
            }
         }
      },
      {
         "Effect": "Allow",
         "Action": [
            "aws-portal:ModifyBilling",
            "ec2:DescribeInstances",
            "iam:ListGroup",
            "iam:ListPolicies",
            "iam:ListRoles",
            "iam:ListUsers",
            "organizations:ListAccounts",
            "organizations:ListOrganizationalUnitsForParent",
            "organizations:ListPolicies",
            "organizations:ListRoots",
            "rds:DescribeDBInstances",
            "sns:ListTopics"
         ],
         "Resource": "*"
      }
   ]
}
```

Allows AWS Budgets broad permission to control AWS resources

Managed policy name: AWSBudgetsActionsRolePolicyForResourceAdministrationWithSSM
This managed policy is focused on specific actions that AWS Budgets takes on your behalf when completing a specific action. This policy gives AWS Budgets broad permission to control AWS resources. For example, starts and stops Amazon EC2 or Amazon RDS instances by executing AWS Systems Manager (SSM) scripts.

```json
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "ec2:DescribeInstanceStatus",
            "ec2:StartInstances",
            "ec2:StopInstances",
            "rds:DescribeDBInstances",
            "rds:StartDBInstance",
            "rds:StopDBInstance"
         ],
         "Resource": "*",
         "Condition": {
            "ForAnyValue:StringEquals": {
               "aws:CalledVia": [
                  "ssm.amazonaws.com"
               ]
            }
         }
      },
      {
         "Effect": "Allow",
         "Action": [
            "ssm:StartAutomationExecution"
         ],
         "Resource": "*"
      }
   ]
}
```

**Billing and Cost Management policy examples**

This topic contains example policies that you can attach to your IAM user or group to control access to your account's billing information and tools. The following basic rules apply to IAM policies for Billing and Cost Management:

- **Version** is always 2012-10-17.
- **Effect** is always Allow or Deny.
- **Action** is the name of the action or a wildcard (*).

The action prefix is `budgets` for AWS Budgets, `cur` for AWS Cost and Usage Reports, `aws-portal` for AWS Billing, or `ce` for Cost Explorer.

- **Resource** is always * for AWS Billing.

For actions performed on a budget resource, specify the budget Amazon Resource Name (ARN).

- It's possible to have multiple statements in one policy.

**Note**

These policies require that you activate IAM user access to the Billing and Cost Management console on the Account Settings console page. For more information, see Activating access to the Billing and Cost Management console (p. 172).
Example topics

- Allow IAM users to view your billing information (p. 182)
- Allow IAM users to access the reports console page (p. 183)
- Deny IAM users access to the Billing and Cost Management console (p. 183)
- Allow full access to AWS services but deny IAM users access to the Billing and Cost Management console (p. 183)
- Allow IAM users to view the Billing and Cost Management console except for account settings (p. 184)
- Allow IAM users to modify billing information (p. 184)
- Allow IAM users to create budgets (p. 185)
- Deny access to account settings, but allow full access to all other billing and usage information (p. 185)
- Deposit reports into an Amazon S3 bucket (p. 186)
- Find products and prices (p. 186)
- View costs and usage (p. 187)
- Enable and disable AWS Regions (p. 187)
- View and manage cost categories (p. 187)
- Create, view, edit, or delete AWS Cost and Usage Reports (p. 188)
- View and manage purchase orders (p. 188)
- View and update the Cost Explorer preferences page (p. 188)
- View, create, update, and delete using the Cost Explorer reports page (p. 189)
- View, create, update, and delete reservation expiration alerts (p. 191)
- Allow read-only access to anomaly detection (p. 192)
- Allow AWS Budgets to apply IAM policies and SCPs and target EC2 and RDS instances (p. 192)

Allow IAM users to view your billing information

To allow an IAM user to view your billing information without giving the IAM user access to sensitive account information, such as your password and account activity reports, use a policy similar to the following example policy. This policy allows IAM users to view the following Billing and Cost Management console pages, without giving them access to the Account Settings or Reports console pages:

- Dashboard
- Cost Explorer
- Bills
- Orders and invoices
- Consolidated Billing
- Preferences
- Credits
- Advance Payment

```json
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
```
Allow IAM users to access the reports console page

To allow an IAM user to access the Reports console page and to view the usage reports that contain account activity information, use a policy similar to this example policy.

For definitions of each action, see Billing and Cost Management actions policies.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewUsage",
                "aws-portal:ViewBilling",
                "cur:DescribeReportDefinitions",
                "cur:PutReportDefinition",
                "cur:DeleteReportDefinition",
                "cur:ModifyReportDefinition"
            ],
            "Resource": "*"
        }
    ]
}
```

Deny IAM users access to the Billing and Cost Management console

To explicitly deny an IAM user access to the all Billing and Cost Management console pages, use a policy similar to this example policy.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": "aws-portal:*",
            "Resource": "*"
        }
    ]
}
```

Allow full access to AWS services but deny IAM users access to the Billing and Cost Management console

To deny IAM users access to everything on the Billing and Cost Management console, use the following policy. In this case, you should also deny user access to AWS Identity and Access Management (IAM) so that the users can't access the policies that control access to billing information and tools.

**Important**

This policy doesn't allow any actions. Use this policy in combination with other policies that allow specific actions.
Allow IAM users to view the Billing and Cost Management console except for account settings

This policy allows read-only access to all of the Billing and Cost Management console, including the Payments Method and Reports console pages, but denies access to the Account Settings page, thus protecting the account password, contact information, and security questions.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "aws-portal:*View",
            "Resource": "*"
        },
        {
            "Effect": "Deny",
            "Action": "aws-portal:*Account",
            "Resource": "*"
        }
    ]
}
```

Allow IAM users to modify billing information

To allow IAM users to modify account billing information in the Billing and Cost Management console, you must also allow IAM users to view your billing information. The following policy example allows an IAM user to modify the Consolidated Billing, Preferences, and Credits console pages. It also allows an IAM user to view the following Billing and Cost Management console pages:

- Dashboard
- Cost Explorer
- Bills
- Orders and invoices
- Advance Payment

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "aws-portal:*Billing",
            "Resource": "*"
        }
    ]
}
```
Allow IAM users to create budgets

To allow IAM users to create budgets in the Billing and Cost Management console, you must also allow IAM users to view your billing information, create CloudWatch alarms, and create Amazon SNS notifications. The following policy example allows an IAM user to modify the Budget console page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "Stmt1435216493000",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling",
                "aws-portal:ModifyBilling",
                "budgets:ViewBudget",
                "budgets:ModifyBudget"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Sid": "Stmt1435216514000",
            "Effect": "Allow",
            "Action": [
                "cloudwatch:*"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Sid": "Stmt1435216552000",
            "Effect": "Allow",
            "Action": [
                "sns:*"
            ],
            "Resource": [
                "arn:aws:sns:us-east-1"
            ]
        }
    ]
}
```

Deny access to account settings, but allow full access to all other billing and usage information

To protect your account password, contact information, and security questions, you can deny IAM user access to Account Settings while still enabling full access to the rest of the functionality in the Billing and Cost Management console, as shown in the following example.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cloudwatch:*",
                "budgets:ViewBudget",
                "budgets:ModifyBudget"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Effect": "Deny",
            "Action": [
                "iam:GetAccountSettings"
            ],
            "Resource": [
                "*"
            ]
        }
    ]
}
```
Deposit reports into an Amazon S3 bucket

The following policy allows Billing and Cost Management to save your detailed AWS bills to an Amazon S3 bucket, as long as you own both the AWS account and the Amazon S3 bucket. Note that this policy must be applied to the Amazon S3 bucket, instead of to an IAM user. That is, it's a resource-based policy, not a user-based policy. You should deny IAM user access to the bucket for IAM users who don't need access to your bills.

Replace `bucketname` with the name of your bucket.

For more information, see Using Bucket Policies and User Policies.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "Service": "billingreports.amazonaws.com"
      },
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketPolicy"
      ],
      "Resource": "arn:aws:s3:::bucketname"
    },
    {
      "Effect": "Allow",
      "Principal": {
        "Service": "billingreports.amazonaws.com"
      },
      "Action": "s3:PutObject",
      "Resource": "arn:aws:s3:::bucketname/*"
    }
  ]
}
```

Find products and prices

To allow an IAM user to use the AWS Price List Service API, use the following policy to grant them access.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "Service": "billingreports.amazonaws.com"
      },
      "Action": "s3:GetObject"
    }
  ]
}
```
View costs and usage

To allow IAM users to use the AWS Cost Explorer API, use the following policy to grant them access.

```json
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "ce:*"
      ],
      "Resource": [
        "*"
      ]
    }
  ]
}
```

Enable and disable AWS Regions

For an example IAM policy that allows users to enable and disable Regions, see AWS: Allows Enabling and Disabling AWS Regions in the IAM User Guide.

View and manage cost categories

To allow IAM users to use, view, and manage Cost Categories, use the following policy to grant them access.

```json
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "VisualEditor0",
      "Effect": "Allow",
      "Action": [
        "aws-portal:ViewBilling",
        "ce:DescribeCostCategoryDefinition",
        "ce:UpdateCostCategoryDefinition",
        "ce:CreateCostCategoryDefinition",
        "ce:DeleteCostCategoryDefinition",
        "ce:ListCostCategoryDefinitions",
        "pricing:DescribeServices"
      ],
      "Resource": "*"
    }
  ]
}
```
Create, view, edit, or delete AWS Cost and Usage Reports

This policy allows an IAM user to create, view, edit, or delete sample-report using the API.

```json
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Sid": "ManageSampleReport",
         "Action": [
            "cur:PutReportDefinition",
            "cur:DeleteReportDefinition",
            "cur:ModifyReportDefinition"
         ],
         "Resource": "arn:aws:cur:*:123456789012:definition/sample-report"
      },
      {
         "Sid": "DescribeReportDefs",
         "Effect": "Allow",
         "Action": "cur:DescribeReportDefinitions",
         "Resource": "*"
      }
   ]
}
```

View and manage purchase orders

This policy allows an IAM user to view and manage purchase orders, using the following policy to grant access.

```json
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Sid": "VisualEditor0",
         "Effect": "Allow",
         "Action": [
            "aws-portal:ViewBilling",
            "purchase-orders:ViewPurchaseOrders",
            "purchase-orders:ModifyPurchaseOrders"
         ],
         "Resource": "*"
      }
   ]
}
```

View and update the Cost Explorer preferences page

This policy allows an IAM user to view and update using the Cost Explorer preferences page.

```json
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Sid": "VisualEditor0",
         "Effect": "Allow",
         "Action": [
            "aws-portal:ViewBilling",
            "ce:UpdatePreferences"
         ]
      }
   ]
}
```
The following policy allows IAM users to view Cost Explorer, but deny permission to view or edit the Preferences page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling"
            ],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ce:GetPreferences",
                "ce:UpdatePreferences"
            ],
            "Resource": "*"
        }
    ]
}
```

The following policy allows IAM users to view Cost Explorer, but deny permission to edit the Preferences page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling"
            ],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ce:UpdatePreferences"
            ],
            "Resource": "*"
        }
    ]
}
```

View, create, update, and delete using the Cost Explorer reports page

This policy allows an IAM user to view, create, update, and delete using the Cost Explorer reports page.
The following policy allows IAM users to view Cost Explorer, but deny permission to view or edit the Reports page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling"
            ],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ce:DescribeReport",
                "ce:CreateReport",
                "ce:UpdateReport",
                "ce:DeleteReport"
            ],
            "Resource": "*"
        }
    ]
}
```

The following policy allows IAM users to view Cost Explorer, but deny permission to edit the Reports page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling"
            ],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ce:DescribeReport",
                "ce:CreateReport",
                "ce:UpdateReport",
                "ce:DeleteReport"
            ],
            "Resource": "*"
        }
    ]
}
```
View, create, update, and delete reservation expiration alerts

This policy allows an IAM user to view, create, update, and delete reservation expiration alerts. To edit Reservation Expiration Alerts, a user needs all three granular actions `ce:CreateNotificationSubscription`, `ce:UpdateNotificationSubscription`, and `ce:DeleteNotificationSubscription`.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "aws-portal:ViewBilling",
                "ce:CreateNotificationSubscription",
                "ce:UpdateNotificationSubscription",
                "ce:DeleteNotificationSubscription"
            ],
            "Resource": "*"
        }
    ]
}
```

The following policy allows IAM users to view Cost Explorer, but deny permission to view or edit the `Reservation Expiration Alerts` page.

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": ["aws-portal:ViewBilling"],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ce:DescribeNotificationSubscription",
                "ce:CreateNotificationSubscription",
                "ce:UpdateNotificationSubscription",
                "ce:DeleteNotificationSubscription"
            ],
            "Resource": "*"
        }
    ]
}
```
The following policy allows IAM users to view Cost Explorer, but deny permission to edit the Reservation Expiration Alerts page.

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Sid": "VisualEditor0",  
      "Effect": "Allow",  
      "Action": [  
        "aws-portal:ViewBilling"  
      ],  
      "Resource": "*"  
    },  
    {  
      "Sid": "VisualEditor1",  
      "Effect": "Deny",  
      "Action": [  
        "ce:CreateNotificationSubscription",  
        "ce:UpdateNotificationSubscription",  
        "ce:DeleteNotificationSubscription"  
      ],  
      "Resource": "*"  
    }  
  ]
}
```

Allow read-only access to anomaly detection

To allow IAM users read-only access to anomaly detection, use the following policy to grant them access. `ce:ProvideAnomalyFeedback` is optional as a part of the read-only access.

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Action": [  
        "ce:Get*"  
      ],  
      "Effect": "Allow",  
      "Resource": "*"  
    }  
  ]
}
```

Allow AWS Budgets to apply IAM policies and SCPs and target EC2 and RDS instances

This policy allows AWS Budgets to apply IAM policies and service control policies (SCPs), and to target Amazon EC2 and Amazon RDS instances on behalf of the user.

Trust policy

```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Effect": "Allow",  
      "Principal": {  
        "Service": "budgets.amazonaws.com"  
      }  
    }  
  ]
}
```
Logging and monitoring in AWS Billing and Cost Management

Monitoring is an important part of maintaining the reliability, availability, and performance of your AWS account. There are several tools available to monitor your Billing and Cost Management usage.

tracks your AWS usage and provides estimated charges associated with your account. Each report
contains line items for each unique combination of AWS products, usage type, and operation that you
use in your AWS account. You can customize the to aggregate the information either by the hour or by
the day.

For more information about , see the Cost and Usage Report Guide.

Cost Explorer

Cost Explorer enables you to view and analyze your costs and usage. You can monitor data for up
to the last 12 months, forecast how much you're likely to spend for the next three months, and get
recommendations for what Reserved Instances to purchase. You can use Cost Explorer to identify areas
that need further inquiry and see trends that you can use to understand your costs.

For more information about Cost Explorer, see the Analyzing your costs with Cost Explorer (p. 57).
# Budgets

Budgets enables you to track your AWS cost and usage by using the cost visualization provided by Cost Explorer. Budgets shows the status of your budgets, provides forecasts of your estimated costs, and tracks your AWS usage, including Free Tier. You can also receive notifications when your estimated costs exceed your budgets.

For more information about Budgets, see the Managing your costs with AWS Budgets (p. 95).

## AWS CloudTrail

Billing and Cost Management is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in Billing and Cost Management. CloudTrail captures all write and modify API calls for Billing and Cost Management as events, including calls from the Billing and Cost Management console and from code calls to the Billing and Cost Management APIs.

For more information about AWS CloudTrail, see the Logging Billing and Cost Management API calls with AWS CloudTrail (p. 148).

# Compliance validation for AWS Billing and Cost Management

Third-party auditors assess the security and compliance of AWS services as part of multiple AWS compliance programs. Billing and Cost Management 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.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading Reports in AWS Artifact.

Your compliance responsibility when using Billing and Cost Management 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.

# Resilience in AWS Billing and Cost Management

The AWS global infrastructure is built around AWS Regions and Availability Zones. AWS Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. With Availability Zones, you can design and operate...
applications and databases that automatically fail over between zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about AWS Regions and Availability Zones, see AWS Global Infrastructure.

Infrastructure security in AWS Billing and Cost Management

As a managed service, AWS Billing and Cost Management is protected by the AWS global network security procedures that are described in the Amazon Web Services: Overview of Security Processes whitepaper.

You use AWS published API calls to access Billing and Cost Management through the network. Clients must support Transport Layer Security (TLS) 1.0 or later. We recommend TLS 1.2 or later. Clients must also support cipher suites with perfect forward secrecy (PFS) such as Ephemeral Diffie-Hellman (DHE) or Elliptic Curve Ephemeral Diffie-Hellman (ECDHE). Most modern systems such as Java 7 and later support these modes.

Additionally, requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the AWS Security Token Service (AWS STS) to generate temporary security credentials to sign requests.
Quotas and restrictions

The following table describes the current quotas, restrictions, and naming constraints within AWS Billing and Cost Management.

**Topics**
- Budgets (p. 196)
- Budget reports (p. 196)
- AWS Cost Categories (p. 196)
- Cost Explorer (p. 197)
- Purchase orders (p. 197)
- Anomaly detection (p. 197)

### Budgets

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of free budgets per account</td>
<td>2</td>
</tr>
<tr>
<td>Total number of budgets per management account</td>
<td>20,000</td>
</tr>
<tr>
<td>Characters allowed in a budget name</td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td></td>
</tr>
<tr>
<td>A-Z and a-z</td>
<td></td>
</tr>
<tr>
<td>Space</td>
<td></td>
</tr>
<tr>
<td>The following symbols: _ : / = + - @</td>
<td></td>
</tr>
</tbody>
</table>

### Budget reports

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of budget reports</td>
<td>50</td>
</tr>
<tr>
<td>Maximum number of budgets per budget report</td>
<td>50</td>
</tr>
<tr>
<td>Maximum email recipients in a budget report</td>
<td>50</td>
</tr>
</tbody>
</table>

### AWS Cost Categories

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of AWS Cost Categories per management account</td>
<td>50</td>
</tr>
<tr>
<td>Number of Cost Category rules per Cost Category (API)</td>
<td>500</td>
</tr>
<tr>
<td>Number of Cost Category rules per Cost Category (UI)</td>
<td>100</td>
</tr>
</tbody>
</table>
## Names
- Names must be unique
- Case sensitive

<table>
<thead>
<tr>
<th>value names</th>
<th>Names do not have to be unique</th>
</tr>
</thead>
</table>

## Cost Explorer

<table>
<thead>
<tr>
<th>Maximum number of reports that you can save per account</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of filters in the GetCostAndUsage operation (API)</td>
<td>100</td>
</tr>
</tbody>
</table>

## Purchase orders

| Characters allowed in a purchase order ID | A–Z and a–z
|-----------------------------------------|----------------|
|                                         | Space
|                                         | The following symbols: _ : / = + % @ |

<table>
<thead>
<tr>
<th>Number of characters allowed in a purchase order ID</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of line items per purchase order</td>
<td>100</td>
</tr>
</tbody>
</table>

## Anomaly detection

- 1 monitor per management account
- 100 total monitors per management account
- AWS Marketplace
- AWS Support
- Amazon WorkSpaces
- Upfront and recurring reserved fee and Savings Plan fees
# Document history

The following table describes the documentation for this release of the *AWS Billing and Cost Management User Guide*.

<table>
<thead>
<tr>
<th>update-history-change</th>
<th>update-history-description</th>
<th>update-history-date</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Cost Categories</td>
<td>Added a new Cost Categories feature to map AWS costs into meaningful categories.</td>
<td>April 20, 2020</td>
</tr>
<tr>
<td>New Heritage Tax feature</td>
<td>Added a new feature that enables you to use your tax registration information with your linked accounts.</td>
<td>March 19, 2020</td>
</tr>
<tr>
<td>New china bank redirect payment method</td>
<td>Added a new payment method that allows China CNY customers using AWS Inc. to pay their overdue payments using China Bank Redirect.</td>
<td>February 20, 2020</td>
</tr>
<tr>
<td>New security chapter</td>
<td>Added a new security chapter that provides information about various security controls. Former “Controlling Access” chapter contents have been migrated here.</td>
<td>February 6, 2020</td>
</tr>
<tr>
<td>New AWS Cost and Usage Reports user guide</td>
<td>Migrated and reorganized all AWS Cost and Usage Reports content to a separate user guide.</td>
<td>January 21, 2020</td>
</tr>
<tr>
<td>New reporting method using AWS Budgets</td>
<td>Added a new reporting functionality using AWS Budgets reports.</td>
<td>June 27, 2019</td>
</tr>
<tr>
<td>Added normalized units to Cost Explorer</td>
<td>Cost Explorer reports now include normalized units.</td>
<td>February 5, 2019</td>
</tr>
<tr>
<td>Credit application changes</td>
<td>AWS changed how they apply credits.</td>
<td>January 17, 2019</td>
</tr>
<tr>
<td>New payment behavior</td>
<td>AISPL customers can now enable the auto-charge ability for their payments.</td>
<td>December 20, 2018</td>
</tr>
<tr>
<td>New AWS Price List Service endpoint</td>
<td>Added a new endpoint for AWS Price List Service.</td>
<td>December 17, 2018</td>
</tr>
<tr>
<td>Updated the Cost Explorer UI</td>
<td>Updated the Cost Explorer UI.</td>
<td>November 15, 2018</td>
</tr>
<tr>
<td>Integrated Amazon Athena into AWS Cost and Usage Reports</td>
<td>Added the ability to upload the data from an AWS Cost and Usage Reports into Athena.</td>
<td>November 15, 2018</td>
</tr>
<tr>
<td>Added budget history</td>
<td>Added the ability to see the history of a budget.</td>
<td>November 13, 2018</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Date</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>Expanded budget services</td>
<td>Expanded RI budgets to Amazon Elasticsearch Service.</td>
<td>November 8, 2018</td>
</tr>
<tr>
<td>Added a new payment method</td>
<td>Added the SEPA Direct Debit payment method.</td>
<td>October 25, 2018</td>
</tr>
<tr>
<td>Added On-Demand capacity reservations (p. 198)</td>
<td>Added documentation about AWS Cost and Usage Reports line items that apply to capacity reservations.</td>
<td>October 25, 2018</td>
</tr>
<tr>
<td>Redesigned budget experience</td>
<td>Updated the budget UI and workflow.</td>
<td>October 23, 2018</td>
</tr>
<tr>
<td>New Reserved Instance recommendation columns</td>
<td>Added new columns to the Cost Explorer RI recommendations.</td>
<td>October 18, 2018</td>
</tr>
<tr>
<td>New AWS CloudTrail actions</td>
<td>More actions added to CloudTrail logging.</td>
<td>October 18, 2018</td>
</tr>
<tr>
<td>Added a new Reserved Instance report</td>
<td>Expanded RI reports to Amazon Elasticsearch Service.</td>
<td>October 10, 2018</td>
</tr>
<tr>
<td>New AWS Cost and Usage Reports columns (p. 198)</td>
<td>New columns added to the AWS Cost and Usage Reports.</td>
<td>September 27, 2018</td>
</tr>
<tr>
<td>Cost Explorer walkthrough</td>
<td>Cost Explorer now provides a walkthrough for the most common functionality.</td>
<td>September 24, 2018</td>
</tr>
<tr>
<td>Added CloudTrail events</td>
<td>Added additional CloudTrail events.</td>
<td>August 13, 2018</td>
</tr>
<tr>
<td>Added a new payment method</td>
<td>Added the ACH Direct Debit payment method.</td>
<td>July 24, 2018</td>
</tr>
<tr>
<td>Updated the AWS free tier widget</td>
<td>Updated the AWS Free Tier Widget.</td>
<td>July 19, 2018</td>
</tr>
<tr>
<td>Added RI purchase recommendations for additional services</td>
<td>Added RI purchase recommendations for additional services in Cost Explorer.</td>
<td>July 11, 2018</td>
</tr>
<tr>
<td>Added RI purchase recommendations for linked accounts</td>
<td>Added RI purchase recommendations for linked accounts in Cost Explorer.</td>
<td>June 27, 2018</td>
</tr>
<tr>
<td>Added support for AWS Cost and Usage Reports data refreshes</td>
<td>AWS Cost and Usage Reports can now update after finalization if AWS applies refunds, credits, or support fees to an account.</td>
<td>June 20, 2018</td>
</tr>
<tr>
<td>Added CloudTrail support</td>
<td>Added support for CloudTrail event logging.</td>
<td>June 7, 2018</td>
</tr>
<tr>
<td>Added AWS CloudFormation for budgets</td>
<td>Added Budgets templates for AWS CloudFormation.</td>
<td>May 22, 2018</td>
</tr>
<tr>
<td>Updated RI allocation behavior for linked accounts</td>
<td>Updated the RI allocation behavior size-flexible RI for linked accounts.</td>
<td>May 9, 2018</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Date</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>RI coverage alerts</td>
<td>Added RI coverage alerts.</td>
<td>May 8, 2018</td>
</tr>
<tr>
<td>Unblend linked account bills (p. 198)</td>
<td>Linked account bills no longer show the blended rate for the organization.</td>
<td>May 7, 2018</td>
</tr>
<tr>
<td>Updated AWS tax settings</td>
<td>Added the ability to bulk edit tax settings.</td>
<td>April 25, 2018</td>
</tr>
<tr>
<td>Added Amazon RDS recommendations to Cost Explorer</td>
<td>Added Amazon RDS Recommendations to Cost Explorer.</td>
<td>April 19, 2018</td>
</tr>
<tr>
<td>Added a new Cost Explorer dimension and AWS Cost and Usage Reports line item (p. 198)</td>
<td>Added a new Cost Explorer dimension and AWS Cost and Usage Reports line item.</td>
<td>March 27, 2018</td>
</tr>
<tr>
<td>Added purchase recommendations to the Cost Explorer API</td>
<td>Added access to the Amazon EC2 Reserved Instance (RI) purchase recommendations via the Cost Explorer API.</td>
<td>March 20, 2018</td>
</tr>
<tr>
<td>Added RI coverage for Amazon RDS, Amazon Redshift, and ElastiCache</td>
<td>Reserved Instance (RI) coverage for Amazon RDS, Amazon Redshift, and ElastiCache</td>
<td>March 13, 2018</td>
</tr>
<tr>
<td>Added RI coverage to the Cost Explorer API</td>
<td>Added GetReservationCoverage to the Cost Explorer API.</td>
<td>February 22, 2018</td>
</tr>
<tr>
<td>Added AWS free tier alerts</td>
<td>Added AWS Free Tier alerts that enable you stay under the free tier limits.</td>
<td>December 13, 2017</td>
</tr>
<tr>
<td>RI recommendations</td>
<td>Added RI recommendations based on previous usage.</td>
<td>November 20, 2017</td>
</tr>
<tr>
<td>Cost Explorer API</td>
<td>Enabled programmatic access to Cost Explorer via API.</td>
<td>November 20, 2017</td>
</tr>
<tr>
<td>RI utilization alerts for additional services</td>
<td>Added notifications for additional services.</td>
<td>November 10, 2017</td>
</tr>
<tr>
<td>Added RI reports</td>
<td>Expanded RI reports to Amazon RDS, Redshift, and ElastiCache.</td>
<td>November 10, 2017</td>
</tr>
<tr>
<td>Discount sharing preferences</td>
<td>Updated preferences so that AWS credits and RI discount sharing can be turned off.</td>
<td>November 6, 2017</td>
</tr>
<tr>
<td>New Amazon S3 console (p. 198)</td>
<td>Updated for the new Amazon S3 console.</td>
<td>September 15, 2017</td>
</tr>
<tr>
<td>RI utilization alerts</td>
<td>Added notifications for when RI utilization drops below a preset percentage-based threshold.</td>
<td>August 21, 2017</td>
</tr>
<tr>
<td>Updated Cost Explorer UI</td>
<td>Released a new Cost Explorer UI.</td>
<td>August 16, 2017</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Date</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>AWS Marketplace data integration (p. 198)</td>
<td>Added AWS Marketplace so that customers can see their data reflected in all billing artifacts, including the Bills page, Cost Explorer, and more.</td>
<td>August 10, 2017</td>
</tr>
<tr>
<td>Consolidated billing with organizations</td>
<td>Updated the consolidated billing with organizations behavior.</td>
<td>June 20, 2017</td>
</tr>
<tr>
<td>Linked account access and usage type groups in budgets</td>
<td>Added support for creating cost and usage budgets based on specific usage types and usage type groups, and extended budget creation capabilities to all account types.</td>
<td>June 19, 2017</td>
</tr>
<tr>
<td>Regional offer files</td>
<td>The AWS Price List API now offers regional offer files for each service.</td>
<td>April 20, 2017</td>
</tr>
<tr>
<td>Added Cost Explorer advanced options</td>
<td>You can now filter Cost Explorer reports by additional advanced options, such as refunds, credits, RI upfront fees, RI recurring charges, and support charges.</td>
<td>March 22, 2017</td>
</tr>
<tr>
<td>Added a Cost Explorer report</td>
<td>You can now track your Reserved Instance (RI) coverage in Cost Explorer.</td>
<td>March 20, 2017</td>
</tr>
<tr>
<td>Added Cost Explorer filters</td>
<td>You can now filter Cost Explorer reports by tenancy, platform, and the Amazon EC2 Spot and Scheduled Reserved Instance purchase options.</td>
<td>March 20, 2017</td>
</tr>
<tr>
<td>Cost Explorer and budgets for AISPL</td>
<td>AISPL users can now use Cost Explorer and budgets.</td>
<td>March 6, 2017</td>
</tr>
<tr>
<td>Added grouping for Cost Explorer usage types</td>
<td>Cost Explorer supports grouping for both cost and usage data, enabling customers to identify their cost drivers by cross-referencing their cost and usage charts.</td>
<td>February 24, 2017</td>
</tr>
<tr>
<td>Added a Cost Explorer report</td>
<td>You can now track your monthly Amazon EC2 Reserved Instance (RI) utilization in Cost Explorer.</td>
<td>December 16, 2016</td>
</tr>
<tr>
<td>Added a Cost Explorer report</td>
<td>You can now track your daily Amazon EC2 Reserved Instance (RI) utilization in Cost Explorer.</td>
<td>December 15, 2016</td>
</tr>
<tr>
<td>Added AWS-generated cost allocation tags</td>
<td>You can now activate the AWS-generated tag createdBy to track who created an AWS resource.</td>
<td>December 12, 2016</td>
</tr>
<tr>
<td>Added Cost Explorer advanced options</td>
<td>You can now exclude tagged resources from your Cost Explorer reports.</td>
<td>November 18, 2016</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Amazon QuickSight integration for AWS Cost and Usage Reports (p. 198)</td>
<td>AWS Cost and Usage Reports now provide customized queries for uploading your data into Amazon QuickSight.</td>
<td>November 15, 2016</td>
</tr>
<tr>
<td>Expanded budget functionality</td>
<td>You can now use budgets to track usage data.</td>
<td>October 20, 2016</td>
</tr>
<tr>
<td>Expanded Cost Explorer functionality</td>
<td>You can now use Cost Explorer to visualize your costs by usage type groups.</td>
<td>September 15, 2016</td>
</tr>
<tr>
<td>Improved Amazon Redshift integration for AWS Cost and Usage Reports (p. 198)</td>
<td>AWS Cost and Usage Reports now provide customized queries for uploading your data into Amazon Redshift.</td>
<td>August 18, 2016</td>
</tr>
<tr>
<td>AWS Cost and Usage Reports</td>
<td>You can now create and download AWS Cost and Usage Reports.</td>
<td>December 16, 2015</td>
</tr>
<tr>
<td>AWS price list API</td>
<td>You can now download offer files that list the products, prices, and restrictions for a single AWS service.</td>
<td>December 9, 2015</td>
</tr>
<tr>
<td>Cost Explorer report manager</td>
<td>You can now save Cost Explorer queries.</td>
<td>November 12, 2015</td>
</tr>
<tr>
<td>AWS free tier tracking</td>
<td>You can now track how much of your free tier limit you’ve used.</td>
<td>August 12, 2015</td>
</tr>
<tr>
<td>Budgets and forecasting</td>
<td>You can now manage your AWS usage and costs using budgets and cost forecasts.</td>
<td>June 29, 2015</td>
</tr>
<tr>
<td>Amazon Internet Services Pvt. Ltd</td>
<td>You can now manage your account settings and payment methods for an Amazon Internet Services Pvt. Ltd (AISPL) account.</td>
<td>June 1, 2015</td>
</tr>
<tr>
<td>Expanded Cost Explorer functionality</td>
<td>You can now use Cost Explorer to visualize your costs by Availability Zone, API operation, purchase option, or multiple cost allocation tags.</td>
<td>February 19, 2015</td>
</tr>
<tr>
<td>Preferred payment currencies</td>
<td>You can now change the currency associated with your credit card.</td>
<td>February 16, 2015</td>
</tr>
<tr>
<td>Expanded Cost Explorer functionality</td>
<td>You can now use Cost Explorer to visualize your costs by Amazon EC2 instance type or region.</td>
<td>January 5, 2015</td>
</tr>
<tr>
<td><strong>Avoiding unexpected charges</strong></td>
<td>Revised and expanded Avoiding Unexpected Charges and Using the Free Tier.</td>
<td>August 19, 2014</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>IAM user permissions</strong></td>
<td>You can now enable AWS Identity and Access Management (IAM) users and federated users to access and manage your account settings, view your bills, and perform cost management. For example, you can grant people in your finance department full access to the financial setup and control of your AWS account, without having to give them access to your production AWS environment.</td>
<td>July 7, 2014</td>
</tr>
<tr>
<td><strong>Cost Explorer launched</strong></td>
<td>Cost Explorer provides a visualization of your AWS costs that enables you to analyze your costs in multiple ways.</td>
<td>April 8, 2014</td>
</tr>
<tr>
<td><strong>Version 2.0 published (p. 198)</strong></td>
<td>The <em>AWS Billing and Cost Management User Guide</em> has been reorganized and rewritten to use the new Billing and Cost Management console.</td>
<td>October 25, 2013</td>
</tr>
</tbody>
</table>
AWS glossary

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