How Allocation and Visibility Drive Cost Accountability

From tagging to showback and chargeback

Establish cloud cost ownership to drive smart decision making

A clear understanding of your cloud usage and costs is critical to getting the most out of your Amazon Web Services (AWS) cloud enablement.

To achieve that goal, stakeholders across the business—from finance to technology to business leadership—need to know where costs are being generated and who's generating them. When you can accurately map cloud costs to business owners, you can make informed, strategic decisions about your AWS investment. Without that, you're just paying the bill and hoping for the best.

In this eBook, you will learn about building an allocation strategy, creating a cost-conscious culture, and how the right tool can give you the visibility and accountability your organization needs.

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Cloud billing is a big data challenge

The rise of public cloud has given us a unique opportunity to assign infrastructure costs back to the business based on actual consumption. At the heart of this opportunity is billing data that is extremely granular and updated constantly throughout the month. It's worth reviewing how customers receive this information and the challenges its scale poses.

AWS provides a monthly detailed billing file—called the AWS Cost and Usage Reports (AWS CUR)—where every resource for every hour appears as an individual row. This can be something well known like the cost of an Amazon Elastic Compute Cloud (Amazon EC2) instance or something more obscure like the cost of Amazon CloudWatch custom metrics. Due to the scale of cloud infrastructure it's common that these billing files will extend to tens or hundreds of millions of rows. Each of these rows can have as many as 120 or more attribute columns, and if you've got a strong strategy in place, you can use them to accurately allocate all of your costs.

With so much data associated with your cloud spend, it can be challenging to relate costs directly to the business value you are delivering. Spreadsheets can only do so much and, at some point, reach a critical mass that's impossible to maintain and analyze. Given the level of complete visibility into AWS usage that customers demand, a solution that can address such large and complex data needs is essential.

Importance of building a cloud financial management practice

To gain true visibility into your organization's cloud cost, it's helpful to have a financial operations (FinOps) team assembled with representatives from finance, engineering, development, operations, and lines of business.

The overarching goal is for everyone to understand the interplay between the actual infrastructure, the infrastructure costs, and the business goals to make more informed decisions.

This interdisciplinary group works together to decide on a cost allocation structure and policies that can group AWS costs in business meaningful ways, giving the various stakeholders specific insight into their area of interest.

You will want to create a structure that's in line with the way your business thinks. Do you need to group based on service, application, project, team, business unit or even classify the types of spend as cost of goods sold (COGS) versus operating expenses (OPEX)? All of these will be possible and the foundations for defining them typically start with two key billing attributes: accounts and resource tags.

The foundational layer of allocation

This foundational structure of accounts and resource tags are fundamental. Let's start with tags.

Tags are metadata labels (each with a key and a value) that you assign to your resources. The key is like the column heading on a spreadsheet, and a value is tied to that key. Think of it like describing a bunch of shirts. Each shirt has a key for color, then a value of red, blue, or green. By using this system for categorizing and grouping your infrastructure, you can sort your AWS resources into a variety of different buckets.

Truth be told, it doesn't matter what key and values you use. To AWS, tags are strings of characters with no semantic meaning. Tags are only meaningful to you. This is why it's so important to craft your tag strategy around your business systems.

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Tagging tips

Here are a few things to remember about tags:

1. Tags for tracking Cost Allocation must be enabled

Applying a tag to a resource isn't enough. To have details related to Cost Allocation tags appear in the AWS CUR report, you must first activate the tag by accessing the Billing and Cost Management section of the AWS Management Console.

In addition to user-defined Cost Allocation tags, AWS also automatically applies an "aws:createdBy" tag, whose value (account-type:account-ID, access-key:user-name or role session name depending on the type of entity creating the resource) can be used to bucket spend.

It's important to note that this AWS generated tag must also be explicitly activated before it will appear in the AWS CUR data.

2. Tagging isn't retroactive

Tags begin to organize and track data as soon as they are activated and applied, but they aren't applied retroactively. This is why it's important to plan your tagging strategies ahead of time for comprehensive reporting. For example, creating an Amazon EC2 instance on January 1 without assigning a tag to it until February 1 leaves the instance's January data untagged and untracked. By using a feature like Apptio Cloudability's **Business Mappings**, you can still gain a level of allocation to spend that is untagged, allowing you a level of visibility into previous tagging issues.

Tagging tips

(Continued)

3. Automate as much as possible

AWS offers a variety of tools to help you implement proactive tag governance practices by ensuring that tags are consistently applied when resources are created.

With AWS Service Catalog, as users deploy curated IT services that are approved for use on AWS, AWS Service Catalog AutoTags can add unique identifiers about the user, product, and product version being deployed and TagOptions give users value choices while maintaining a consistent taxonomy. With AWS Identity and Access Management (IAM), you apply tags to IAM users/roles, and create IAM policies to control what they're allowed to do based on their assigned tags or the tags of the resource they are trying to access.

Automation and proactive tag management are important but are not always effective. Many customers also employ reactive tag governance approaches to identify resources that are not properly tagged and correct them.

Tags need to match exactly. In the eyes of AWS, the tag Enterprise is different from the tag enterprise. Misspellings, variations in case, and abbreviations occur all too often when human beings create tags. Reactive tag governance approaches include: (1) programmatically using tools such as the AWS Resource Groups Tagging API, AWS Config rules, and custom scripts; or (2) manually using AWS Resource Groups Tag Editor and detailed billing reports. If you're of the scale that you're using AWS Organizations to manage multiple AWS accounts across your business, using AWS tag policies is a way to easily adopt a standardized approach for tagging AWS resources while providing centralized governance and management.

Tagging tips

(Continued)

4. The Name tag is extremely useful

The Name tag is an underused asset. Use the Name tag value across multiple resources to roll up costs into a single line item. Here are some ways to use the Name tag:

- Tag Amazon Simple Storage Service (Amazon S3) buckets with the Name tag to track storage and bandwidth.
- Apply the same Name tag to Amazon Elastic Block Store (Amazon EBS) volumes that you've applied to its Amazon EC2 instance to get total compute cost.
- Tag Amazon Relational Database Service (Amazon RDS) instances, snapshots, and replicas.

AWS has a limit of 50 tags per resource. If you want to use more tags, you can concatenate the Name tag with another tag. For example, name=Service-Role-Node instead of just name=instance_id.

5. Tag everything

In general, you should tag everything that you can. You want to minimize the amount of spending in untagged resources. Tag coverage can be used as a key performance indicator. After all, if spending is untagged, then it's much harder to track down how it's being used. Governance at the point of provisioning can be used to drive consistent tagging along with policies around how to identify and remediate untagged resources.

Central management across multiple AWS accounts

As you grow and scale your workloads, AWS Organizations will help you manage billing; control access, compliance, and security; and share resources across your AWS accounts. Through integrations with other AWS services, **AWS Organizations** allows you to define central policies and resource sharing across accounts in your organization. AWS Organizations is available to all AWS customers at no additional charge.

Consolidated billing of AWS accounts

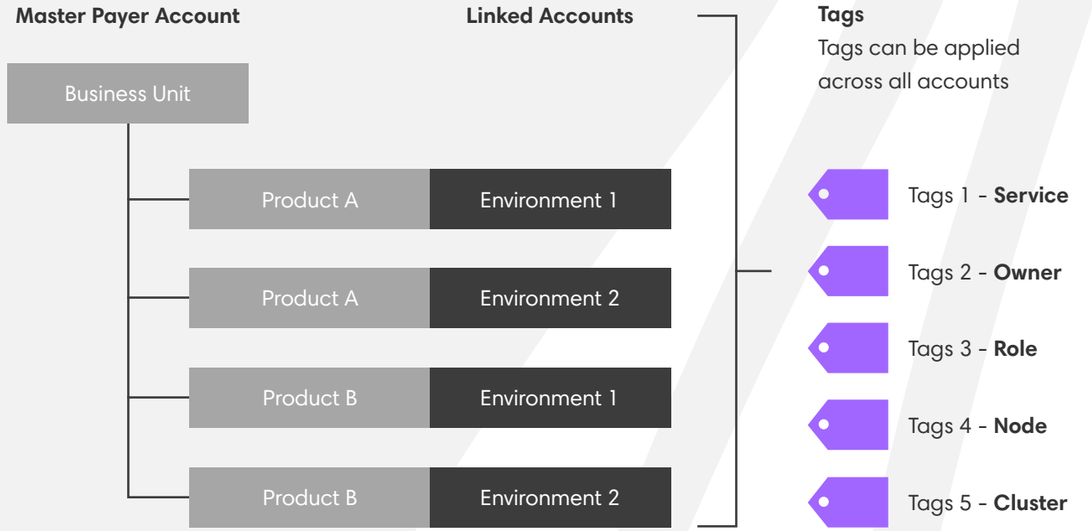
Cost optimization tip:

When using consolidated billing, your Reserved Instances (RIs) can be shared between member accounts, allowing you to combine your usage to dramatically increase your coverage. To find out more, check out this eBook:

The Complete Guide to Saving with AWS Reserved Instances.

Beyond tagging, you can use your account structure itself to organize your AWS spend, especially when you use consolidated billing in AWS Organizations. Consolidated billing allows you to simplify payments for multiple accounts by creating hierarchy with a master account that pays for all the member accounts under it.

Consolidated billing is a great way to show a clean division between cost areas. For example, you might want separate accounts for development, staging, and production environments for each product that your company offers.



In this example, the master account is the business unit (BU). Below the business unit are member accounts that represent different environments for different products. Consolidated billing gives you discrete divisions without having to spin up several different payer accounts. Tags apply across all accounts, making it easy to allocate and compare costs or usage.

If you're using AWS GovCloud, remember that your GovCloud accounts are linked to an AWS commercial account for bill purposes. If breaking out your GovCloud spend from your non-GovCloud spend is important, you should create a separate AWS commercial account linked to GovCloud and ensure that no other spend occurs in it.

Crafting a unified tagging and consolidated billing strategy

Crafting a strategy for how to tag resources and group accounts is at least as much about social interactions as it is about technology. Remember that tags are only meaningful to you and how you organize your cloud resources, so make sure that your tagging strategy is designed to mirror your company structure and reporting system.

The goal is to create a strategy that fits so seamlessly into your organization structure that using the tags and accounts to allocate costs becomes intuitive. When done right, it should only be a matter of months before you have high tag coverage, a culture where all resources are tagged, and complete allocation of costs.

Communication is key

Keep it simple

Formulate your questions

Communication is key

The first step is to get everyone involved. Sit down with stakeholders from finance, technology, and business leadership to make sure you understand what everyone needs. If you already have tags and consolidated billing in place, then the first step is to audit what exists and make sure the structure works for every team.

Keep it simple

Implementing a reporting strategy can seem overwhelming when you have a complex infrastructure, so keep your initial strategy simple. Start with three to five obvious areas which have costs you want to understand. For example, you might initially focus on the business unit, the product, the owner and the role. Even a few small first steps yield big returns in terms of information.

Formulate your questions

You're doing all this work because you need answers about how your company is using the cloud, so take the time to define the questions. You should be looking for answers to questions like these:

- What business unit of the organization should this cost be charged to?
- Which cost centers are driving my costs up or down?
- How much does it cost to operate a product that you're responsible for?
- Are there unused resources in my dev/test environment?

Terms such as "business unit" and "cost centers" should tell you where you want to focus your attention.

Set up your nomenclature

Once all the stakeholders have agreed on what needs to be targeted, you can define the specific tags and consolidated billing structure you want to use. Again, where tags are concerned, consistency is key, so consider using automation to apply them. To get you started, here are some of the most commonly used tags:

Cost center

The cost center tag reports on resources used by specific departments or teams. If needed, you can use more than one tag per instance, such as reporting costs/usage by division and then department by applying two tags (division=X and department=Y) to each resource.

Product or project

Tagging by product is handy for tracking costs related to products sold to consumers, while tagging by project is often used for tracking R&D efforts.

Application or service

Service-oriented architectures are becoming the norm for companies with complex applications and infrastructures. A service tag pinpoints the cost and usage of resources tied to specific services. The tag lets you monitor costs per service to identify unexpected changes.

Employee

Engineers often spin up and down resources for their own development and testing efforts, so the usage should be brief. An employee tag helps monitor this to avoid orphaned resources. Small teams might do this manually, while larger teams could leverage the resources mentioned earlier to ensure AWS resources are created with the required tags automatically applied.

Environment

Using the environment tag allows you to see the true cost of each specific environment, such as the production, development, staging, or demo environment. Accurate tagging helps you avoid artificially inflating production costs by factoring in costs from other environments.

Role

The role tag helps tie resources to their actual purpose within your organization's technology architecture.

Software version

Using the software version tag lets you tag resources by versions of an app or project to group or compare costs by software version.

Leverage your foundations to deliver full business reporting

Investing in your foundational layer, and preferably institutionalizing agreed patterns through build pipelines, provides the platform for the next stage of allocation. The next task is to leverage this detail and apply business rules to it so that you establish official reporting dimensions that are less aligned to the underlying infrastructure and more aligned to the business concepts.

There are several reasons why you can't rely purely on strong conformance to tagging standards to meet all business allocation needs. For example, there are many use cases where it requires you to evaluate multiple attributes to confidently ascertain the ownership of an item. Not everything can be tagged, and sometimes mistakes happen, so having a fall-back mechanism focused on account ownership can help make sure every dollar is accounted for. Other organisations have structured their AWS deployment so that some accounts are team owned while other accounts are shared. Ascertaining cost ownership in this scenario will require rules that span at least account and tag attributes.

Another reason for not stopping at the foundational layer is that you have an opportunity to greatly enrich this data through mapping completely new business layers on top. Even though your base data may not explicitly have information such as the project ownership of a particular service, what application it belongs to or even the type of expense it is—COGS versus OPEX—you can create mapping rules to surface this detail.

This is where **Business Mapping** comes in. This is a rules-based classification engine that categorizes cloud spend to the specific taxonomy of your business. The system is declarative, allowing you to define your specific business logic with dynamic, flexible, and time-adjusted rules. The outputs of this capability are called Business Dimensions, which all users can use for official business reporting across the Cloudability platform.

Leverage your existing IT service management (ITSM) workflows

As you begin to define your tagging strategy, you may already have a substantial view of your cloud IT infrastructure hierarchy within your configuration management database (CMDB). This normally manifests itself with every cloud resource being tagged with a unique identifier such as ServiceID for the service it backs.

Rather than applying redundant tags to resources, Cloudability's purpose-built Business Mapping feature enables you to define the rules for each business grouping or classification upon which reports will be created. This will allow you to build reporting rules that simply reference the ServiceID tag in the AWS CUR data and then correlate against the richer ITSM data in the CMDB.

Beyond this there is a final layer of allocation related to shared costs, such as support charges or containerized workloads, where mapping doesn't complete the allocation story and you are forced to split costs. Make sure to check out these other resources to learn more about **Cost Sharing** and **Container Cost Allocation**.

Showback or chargeback?

Now that you are successfully grouping AWS costs to match your organizational structure and business initiatives it's important to drive accountability via either showback or chargeback. While these terms may seem a bit obscure, the main point here is about clear expectation setting for delivery teams and there being consequences when costs overrun. Both of these practices are about having a shared understanding of: what each team's monthly budget is; how each team has tracked to their monthly budget historically; is your team on track to exceed the current month's budget and how do the next few months look. The point of chargeback or showback is that there are metrics or KPIs related to cloud spend for each team.

So how are chargeback and showback different?

Well, mostly they are not. The thing that differentiates chargeback is that the cost numbers you calculate for each group do end up going on the profit and loss (P&L) statement. Whereas for showback, although teams are being made accountable for their cloud spend, for financial reporting purposes the costs are represented as centrally incurred. One isn't better than the other, but rather is normally informed by internal financial reporting requirements.

Implementing such systems takes time and requires building trust with accurate allocation and clear communication. Sometimes organizations get started with showback prior to attempting chargeback, allowing users to challenge any issues with their cost figures prior to the full chargeback motion.

Focus on empowering your teams

Without being able to reliably understand your cloud bill and allocate these costs in business meaningful ways, you will lack any means to make your delivery teams financially accountable. This is a critical first step. However, simply notifying your teams of their calculated cloud spend on a monthly basis and expecting changes in behavior is likely to lead to disappointment. Cloud financial data is complex and dynamic in nature and therefore it is imperative to provide all your stakeholders interactive tools that allow them to fully engage with this information.

A great starting point is to provide these stakeholders curated **dashboards** that surface the most relevant KPIs and trends in a single page. It goes without saying that the data backing the dashboards needs to be kept current so that teams understand how they are going at any point during the month. Nothing drives out financial accountability like giving your teams official budgets to manage against. Any tool will ideally make this budget information readily available, compare it to historical and forecast spend and pre-emptively notify the relevant stakeholders when forecast to exceed their current month budget. To enable your teams further, Cloudability can provide **visual exploratory tools** to help them develop a deep understanding of their cloud footprint. Depending on your organizational needs there are additional strategies that can be employed including using **AI to detect and notify teams** whenever significant shifts in spending occur.

Visualizing and monitoring your AWS spend with native tools

AWS Cost Explorer is an interface that lets you visualize, understand, and manage your AWS costs and usage over a period of time. It allows you to create custom reports that break down your data at a high level (i.e., across all accounts) or at a micro level to identify treads, pinpoint cost drivers, and detect utilization anomalies.

AWS Cost Categories are a useful way of mapping your AWS costs and usage into meaningful categories. It allows you to organize your costs using a simple rules-based engine that configures your costs in categories across products in the AWS Billing and Cost Management console, AWS Cost Explorer, AWS Budgets, and AWS CUR.

Cloud financial management features to enable allocation and visibility

Tag mapping

AWS views tag keys as a string of characters, and these need to be applied consistently if they're going to be used to aggregate costs together. That means "Environment," "environment," "Env," and typos like "envronment" will all be represented as completely independent tags natively. Tag Mapping lets you consolidate these different versions of the same concept into one reporting dimension so you can make sure your costs are grouped accurately. Learn more

Business mappings

Using Cloudability Business Mapping, companies can view and report on cloud spend in a way that matches their business structure and needs. This could be focused on projects, cost centers, or any other grouping which, once configured, can then be utilized throughout Cloudability. This allows organizations to create more dynamic and flexible allocation models that can be adjusted to their organizational needs. Learn more

Views and dashboards

Central to Cloudability's capacity to scale out financial accountability is how the Views system can be used with organzation-wide dashboards. Filtered views are created so that any user can quickly toggle their entire Cloudability experience to the business context relevant at any given moment. Views can also be used to provide a useful default experience or to restrict access to relevant data. Dashboards within Cloudability are extremely customizable and can include any number of individual widgets. The best results come when a central team curate a shared set of official dashboards which focus in on the most critical information. All team members can then rely on this library of dashboards and simply switch their view to get the lens they require. This is far more powerful than requiring all users to create dashboards from scratch or relying on a static set that may come with a tool. Learn more

Tag explorer

Tag explorer very quickly gives you a global view of your overall tagging health. Each of the tags that you map into Cloudability is represented visually with the tagged component clearly broken out into its constituent parts alongside the untagged bucket. Users can click through this untagged bucket to find the underlying resources for remediation. Learn more

Cloud financial management for AWS

Apptio Cloudability and AWS together accelerate cloud initiatives by optimizing AWS spend, increasing financial confidence and efficiency, and validating business value.

Translate cloud spend into business value

Cloudability enables distributed IT, finance, and business teams to fully embrace cost optimization, the fifth pillar of the AWS Well-Architected Framework. The tool provides unique advantages such as support for multiple master payer accounts and integrated, fully burdened costs throughout the platform that will help increase financial confidence. Robust allocation, visualization, and optimization tools, which include a comprehensive cost optimization dashboard, helps you increase your confidence in cloud spending and improve financial accountability at scale. The result is teams operate at higher cost efficiency and your organization is enabled to continuously improve the business value of your cloud investment.

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