mission CLOUD SERVICES

CloudHealth TECHNOLOGIES

The Ultimate Guide to AWS Savings Plans

Ebook

Introduction

The objectives of The Mission and CloudHealth Ultimate Guide to AWS Savings Plans are to explain how they differ from AWS Reserved Instances, and how they can be best used to minimize AWS cloud costs.

However, while Savings Plans provide greater degrees of flexibility, they don't alleviate all the management burden of Reservations—and in some areas come with greater challenges. We'll explain what these challenges are, explore the consequences of failing to address these challenges, and help you and your business get prepared to take advantage of and effectively manage AWS Savings Plans.

This guide includes example scenarios in which AWS Savings Plans should be used, considerations to take into account before committing to AWS Savings Plans, and a FAQ section. For specific advice about whether AWS Savings Plans are appropriate for your business, contact Mission to schedule a time to speak with a Cloud Advisor.

1 The Backstory to AWS Savings Plans

2011

The option to purchase heavy, medium, or light utilization RIs was introduced.

2012

AWS opened the Reserved Instance Marketplace to buy and sell unused capacity.

2014

Payment options were extended to all upfront, partial upfront, and no upfront.

2015

Dedicated hosts were introduced to give customers a choice of tenancy options.

2016

Scheduled RIs were launched for regular workloads within specific start/stop times.

3-Year Convertible RIs gave customers even more flexible commitment

2017

The ability for customers to change instance sizes within Standard RIs was launched

Convertible RIs offered for one-year terms with more flexible exchanges.

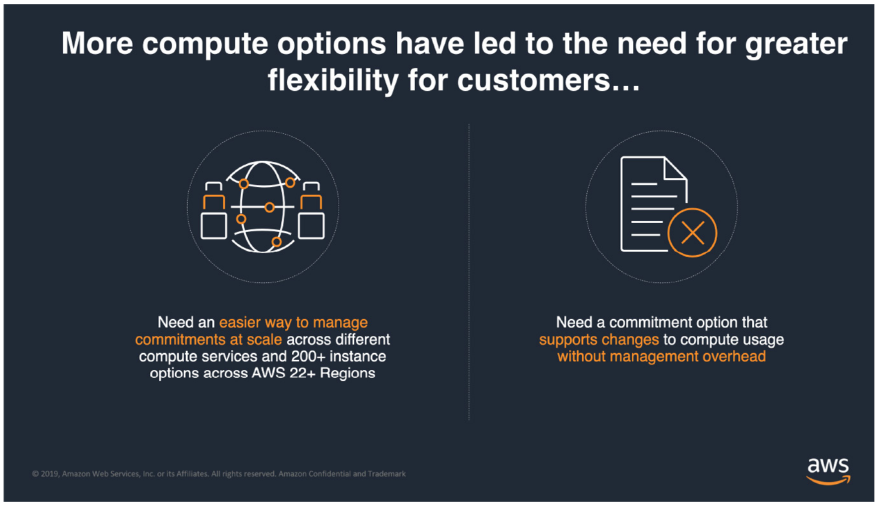
2018

There are over 8,000 permutations of Reserved Instances that can be purchased!

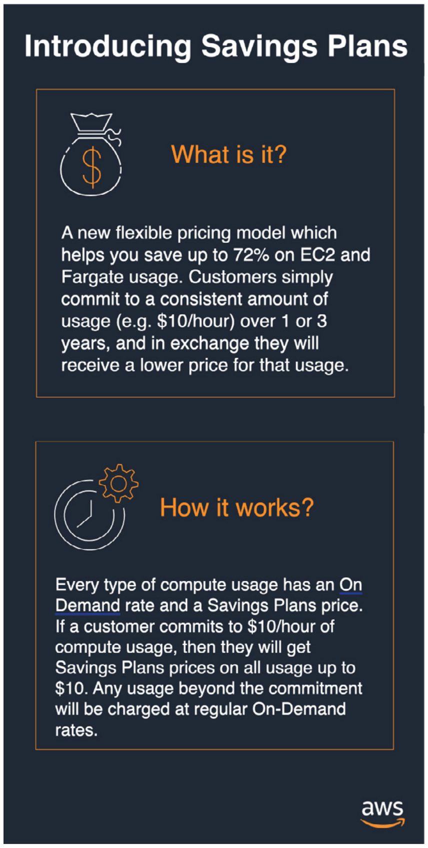
To help explain what AWS Savings Plans are, it's best to start with a brief history lesson of AWS EC2 pricing. When the AWS Elastic Compute Cloud (EC2) service was launched in August 2006, there was only one size, one region, and one pricing option: pay-as-you-go or, as it later became known, "On Demand". Reserved Instances and Spot Instances didn't arrive on the scene until 2009.

By the time Reserved Instances (RIs) were launched, there were five EC2 instance sizes and three regions (two in the U.S. and one in Europe). Initially customers had two "all upfront" options to choose from: a one year term or a three-year term. Then, as RIs grew in popularity and the requirements of customers changed, the options—and the management overhead—multiplied.

The management overhead was further complicated by the launches of new regions and new instance families while reservations were active; and, until the launch of Convertible RIs, customers that had committed to an all-upfront RI purchase never saw the benefits of EC2 price reductions. AWS acknowledged that managing commitments at scale was becoming more complicated—particularly for customers operating in dynamic environments—and AWS Savings Plans were born.



2 What are AWS Savings Plans?



AWS Savings Plans is a program in which customers commit to spending a specific dollar amount per hour over a period of time. In return for the commitment, AWS offers substantial discounts against On Demand rates for EC2 instances and the Fargate container service. Any consumption above the committed amount is charged at On Demand rates.

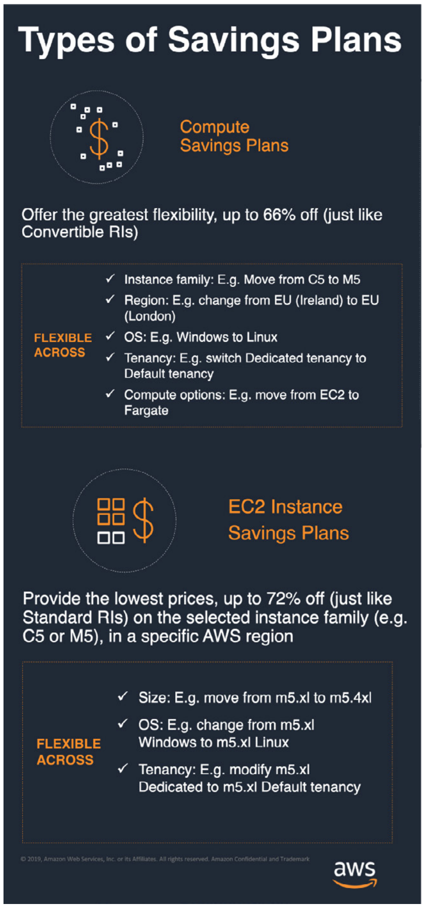
Savings Plans are more flexible than RIs, which makes the purchasing process much simpler. Whereas there are eight components that determine the price of an RI, AWS Savings Plans only have between three and five components:

- The type of plan - EC2 Instance Savings Plan or Compute Savings Plan
- The term of the commitment - one year or three years
- Payment for the commitment - all upfront, partial upfront, or no upfront
- The Region (EC2 Instance Savings Plans only)
- The instance family (EC2 Instance Saving Plans only)

The two types of plans are described in the next section; and, with regards to the term of the commitment, the longer the commitment, the higher the discount. Similarly, customers paying all upfront for a Savings Plan will benefit from a higher discount than customers paying partial upfront or no upfront.

Customers can choose how much they wish to commit to (minimum $0.001 per hour per year) and layer Savings Plans on top of one another. So, for example, a customer could purchase a $10 per hour Savings Plan and as consumption increases,or RI reservations expire,purchase further Savings Plans to maximize the percentage of workloads covered by the discount program and minimize AWS Cloud costs.

3 The Two Types of Savings Plans



The two types of Savings Plan give customers a choice between maximizing the financial benefits of the discount program (by sacrificing flexibility), or maximizing flexibility while benefiting from a smaller discount. In this respect they are similar to Standard RIs and Convertible RIs, and it’s no coincidence that the maximum Savings Plan discounts match those of the RI discount program.

EC2 INSTANCE SAVINGS PLANS

EC2 Instance Savings Plans offer savings of up to 72 percent compared against On Demand rates depending on the term of the commitment, payment option used, and instance family. This plan can only be applied to EC2 instances in a specific instance family in a specific region (i.e. M5 EC2 instances in N. Virginia), but will continue to apply if instance sizes, operating systems, or tenancies are changed.

The differences between AWS Savings Plans and Reserved Instances are highlighted in the next section; but at this stage it’s important to note AWS Savings Plans cannot yet be applied to RDS instances, AWS Redshift, or ElastiCache services. Customers using these services will have to continue using Reserved Instances.

COMPUTE SAVINGS PLANS

Compute Savings Plans offer more flexibility, but a smaller discount—up to 66 percent compared against On Demand rates. The plans can be applied to EC2 instances or Fargate services in any region, across any instance family, and between services (if, for example, container workloads running on Amazon ECS are moved to the Fargate service).

There are advantages to committing to Compute Savings Plans as opposed to EC2 Instance Savings Plans inasmuch as they are the more flexible of the two options. Compute Savings Plans enable customers to plan ahead with greater confidence they will be able to take full advantage of the discount program if the nature of their workloads change over the term of the commitment.

4 How RIs And Savings Plans Differ

While Reservations and Savings Plans have several key differences, one major similarity between them is the need to properly allocate benefits and amortize the upfront costs. Like Reservations, Savings Plans will “float” between linked accounts with an affinity for the purchasing account. This means that tracking and allocating costs and benefits for Savings Plans is just as challenging as it is for Reservations.

Also similarly to Reservations, unused discounts do not accumulate. For example, if you commit to $10 per hour, but only consume $8 of services in any hour, you’ll lose the remaining $2. Therefore it’s critical that you keep track of any Savings Plan waste in order to minimize it in the future. To accomplish both allocation/chargeback and ensure your investments are well utilized, you’ll need a robust cloud financial management strategy and the right tools to support visibility, optimization, and governance.

The primary difference between RIs and Savings Plans is that, with Saving Plans, customers commit to a minimum dollar per hour spend rather than committing to a number of instances level of utilization. Another key difference between Savings Plans and Reservations is that Savings Plans allow you to decide how much money you want to put down upfront for a Partial Upfront Savings Plan, anywhere from 50%-99%. While the savings rate doesn’t change, it gives customers the opportunity to stretch a capital expense budget or potentially spend “use it or lose it” budget at the end of a fiscal period.

Further differences exist between RIs and Saving Plans, but due to the similarities between Standard RIs and EC2 Instances Savings Plans, and Convertible RIs and Compute Savings Plans, it’s easier to explain the differences by comparing each pairing separately.

STANDARD RIS VS. EC2 INSTANCE SAVING PLANS

Standard RIs and EC2 Instance Savings Plans are both family-specific and region-specific (i.e. M5 EC2 instances in N. Virginia), but EC2 Instance Savings Plans can also be applied to different operating systems and tenancies, whereas customers currently need separate Standard RIs for each operating system or tenancy. The situation regarding capacity reservations is slightly more complicated.

With Standard RIs, customers have the option of assigning the RI to a specific Availability Zone in order to reserve capacity. This option doesn’t exist in the Savings Plans discount program.

4 How RIs And Savings Plans Differ *(continued)*

However, it's possible to apply Savings Plans discounts to On Demand Capacity Reservations and thereby indirectly get both the benefits of reserved capacity and a commitment discount.

Comparison of Standard Regional RIs vs. Standard AZ Scoped RIs vs. EC2 Instance Savings Plans

Type >>>	**Standard Regional RIs**	**Standard AZ Scoped RIs**	**EC2 Instance Savings Plans**
Commitment Unit	per Instance	per Instance	Dollars per Hour
Geography	Region Specific	Zone Specific	Any Region
Instance Family	Fixed	Exchangeable	Any Family
Instance Size	Any Size	Must Modify	Any Size
Tenancy	Fixed	Exchangeable	Any Tenancy
Operating System	Fixed	Exchangeable	Any OS

CONVERTIBLE RIS VS. COMPUTE SAVING PLANS

Customers currently using Convertible RIs will likely benefit the most by switching to Compute Savings Plans because of the significant reduction in management overhead. Customers can exchange Convertible RIs for a different size, region, instance family, tenancy, or operating system, but the process is manual. With Compute Savings Plans discounts are applied automatically across all components.

One important point to note with both EC2 Instance Saving Plans and Compute Savings Plans is that they cannot be bought and sold in the Reserved Instances Marketplace. When one of these options is purchased, the customer is committed to the purchase for the lifetime of the plan. This point is discussed further in a later section of the guide.

4 How RIs And Savings Plans Differ *(continued)*

Comparison of Convertible Regional RIs vs. Convertible AZ Scoped RIs vs. Compute Saving Plans			
Type >>>	**Standard Regional RIs**	**Standard AZ Scoped RIs**	**EC2 Instance Savings Plans**
Commitment Unit	per Instance	per Instance	Dollars per Hour
Geography	Region Specific	Zone Specific	Any Region
Instance Family	Exchangeable	Exchangeable	Any Family
Instance Size	Any Size	Must Modify	Any Size
Tenancy	Exchangeable	Exchangeable	Any Tenancy
Operating System	Exchangeable	Exchangeable	Any OS

The chart below provides an overview of how the two types of AWS Savings Plans compare with the two types of RIs. The key word in the chart is "automatically", as it's the automatic application of discounts to EC2 instances and Fargate services that will significantly reduce the management overhead. This factor alone will influence many customers to consider AWS Savings Plans in preference to RIs.

4 How RIs And Savings Plans Differ *(continued)*

Comparing RIs and Savings Plans

Savings plans offer all the benefits of RI as well as improved flexibility and reduced management

	Compute Savings Plans	EC2 Instance Savings Plans	Convertible RIs*	Standard RIs
Savings over On Demand	Up to 66%	Up to 72%	Up to 66%	Up to 72%
Low price in exchange for monetary commitment	✓	✓	✗	✗
Pricing automatically applies to any instance families	✓	✗	✗	✗
Pricing automatically applies to any instance size	✓	✓	✗**	✗**
Pricing automatically applies to any Tenancy, or OS	✓	✓	✗	✗
Automatically apply to Fargate Usage	✓	✗	✗	✗
Pricing automatically applies to across any AWS Region	✓	✗	✗	✗
1- and 3-year Term length options	✓	✓	✓	✓

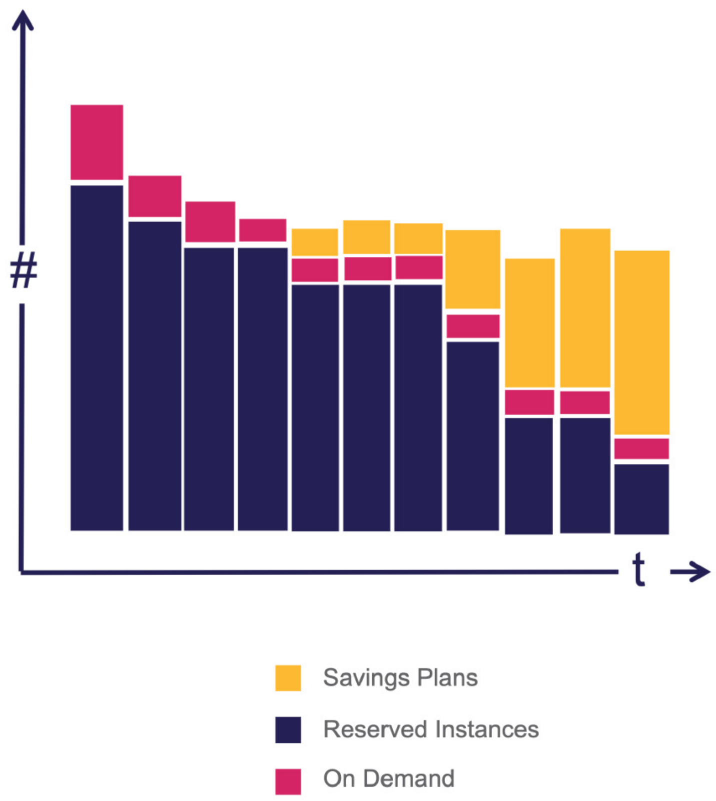
* Convertible RIs can be changed across instance families, sizes, OS and tenancy they require customers to manually perform exchanges.
** Regional Convertible RIs and Regional Standard RIs provide instance size flexibility

5 Examples and Key Considerations

Dollar-for-dollar, there is no direct financial benefit of purchasing AWS Savings Plans to replace fully-optimized and effectively-managed RIs when reservations expire. However, we anticipate many customers will opt for the new discount program due to its increased flexibility and reduced management overhead.

In the excitement of the new discount program, it's important to remember that it's just that—a discount program. AWS Savings Plans are not a substitute for a holistic financial management strategy which includes visibility across accounts to understand what is driving costs in order to effectively manage chargeback, optimization, and governance.

However, there is a case for taking advantage of AWS Savings Plans now to cover excess On Demand inventory. In the example below, we demonstrate how a business that uses RIs can layer an AWS Savings Plan on top of RI coverage to reduce AWS cloud costs by 26 percent until their reservations expire.



5 Examples And Key Considerations *(continued)*

KEY CONSIDERATIONS

Whereas there are some compelling arguments in favor of purchasing AWS Savings Plans, there are several considerations customers should take into account before making a long-term monetary commitment. The first of these was indicated in the example above in as much as the assumption was made utilization of the instances was constant throughout each day.

Had there been peaks during the day and troughs during the night, the amount of instance hours committed to may have far exceeded requirements. Therefore, in order to calculate whether or not layering a Savings Plan on top of an RI is financially viable, it's important to have complete visibility of utilization metrics to avoid wasted Savings Plans discounts.

Following on from this consideration is the fact that, at present, you cannot buy or sell AWS Savings Plans in the AWS Reserved Instances Marketplace. Therefore, if you overcommit to a Savings Plan, it's a financial obligation you are going to be stuck with for up to three years. Again, it will be essential to have effective tools at your disposal in order to accurately forecast demand.

In this respect, it will be beneficial to implement a cloud management platform such as CloudHealth that can provide visibility into utilization and help better manage existing RI reservations by optimizing RI fleets. Furthermore, Mission is able to make tailored Savings Plans recommendations both before and when RI reservations expire.

6 Frequently Asked Questions About AWS Savings Plans

DOES AWS INTEND TO REPLACE RIS WITH SAVINGS PLANS?

RIs will continue to exist in their current form. If you already have Reservations, you can use them as-is alongside Savings Plans and can choose to repurchase them once they expire. Additionally, the new Savings Plans don't support other services for which utilization discounts are available at this time (i.e. RDS, Redshift, ElastiCache, etc.) and Savings Plans may not be appropriate for some customers. Therefore we expect the two discount programs to co-exist for the foreseeable future.

WHAT'S THE BIGGEST ADVANTAGE OF SWITCHING TO SAVINGS PLANS?

Different customers will find different things to like about AWS Savings Plans compared to RIs. For some, increased flexibility may be the biggest advantage. For example, the ability to apply Compute Savings Plans commits across multiple Regions is a big advantage for large global enterprises. For other customers, the reduction in management overhead will bethe biggest benefit.

WHAT'S THE BIGGEST DISADVANTAGE OF SWITCHING TO SAVINGS PLANS?

One of the biggest disadvantages of Savings Plans is that they cannot be exchanged or sold on a secondary marketplace (like the Reserved Instances Marketplace). This means you must take every step to ensure you're making the best commitment, otherwise you run the risk of wasted Savings Plans.

CAN YOU HAVE BOTH RIS AND SAVINGS PLANS IN THE SAME ACCOUNT?

Yes, most customers will have both Reservations and Savings Plans in many of their accounts. Every hour, AWS will assess the possible discount programs that usage qualifies for, and will apply them in the following order: Standard Reservation, Convertible Reservation, Savings Plan. To best balance discount programs, it's necessary for customers to have visibility into and understand current RI inventory, utilization, and burn rate, and then layer Savings Plans onto RIs incrementally.

6 Frequently Asked Questions About AWS Savings Plans *(continued)*

DO YOU HAVE TO CHOOSE BETWEEN THE TWO TYPES OF SAVINGS PLANS?

In the same way as customers can purchase both Standard and Convertible RIs, it's possible to purchase both EC2 Instance Savings Plans and Compute Savings Plans. Dividing Savings Plans between predictable and unpredictable workloads is the best way to maximize flexibility while minimizing AWS Cloud costs.

CAN YOU RESERVE CAPACITY WHEN YOU COMMIT TO AN AWS SAVINGS PLAN?

Unlike One-Zone Reserved Instances, there is no "scope" attribute with Savings Plans. However, customers that require reserved capacity can take advantage of On Demand Capacity Reservations (ODCRs) and apply Savings Plans discounts to the ODCR deployments.

WHAT IS THE MINIMUM MONETARY COMMITMENT REQUIRED FOR A SAVINGS PLAN?

Whichever type of Savings Plan best suits your requirements, the minimum monetary commitment is one tenth of a cent per hour ($0.001). This means you only have to spend $8.76 per year ($0.001 x 24 hours x 365 days) in order to qualify for a discount.

WHAT HAPPENS IF I DON'T SPEND MY MINIMUM MONETARY COMMITMENT?

If you don't meet the minimum monetary commitment in any given hour, that Savings Plan benefit is forfeited. For example, if you commit to $10 per hour, but only consumes $8 of services in any hour, you'll lose the remaining $2. However, if you're using linked or consolidated accounts, it's likely that the unused Savings Plan commitment would have "floated" to benefit another account.

DO THE SAVINGS PLANS MEAN I DON'T HAVE TO RIGHTSIZE EC2 INSTANCES ANYMORE?

Optimization is just as important as it's always been. If a Savings Plan is applied to an overprovisioned EC2 instance, the discount is being wasted on services that aren't being used. Inasmuch as Savings Plans can help minimize AWS Cloud costs, you'l still have to take responsibility for optimization.

7 What Your Boss Needs To Know About Savings Plans

If you've downloaded a Guide to AWS Savings Plans, words like EC2 instance and Convertible RIs are probably part of your everyday lexicon. However, if you report up to a business leader less conversant in cloud lingo, and you're getting questions about how AWS Savings Plans might impact your business, here are three things your boss needs to know about Savings Plans.

1. SAVINGS PLANS ARE PRE-PAID DISCOUNT PROGRAMS FOR SELECT AWS SERVICES.

Although most people think of the public cloud as using a pay-as-you-go pricing model, all the major cloud providers offer options for customers to make an upfront commitment for 1-3 years in exchange for a discount. Savings Plans are the latest upfront commitment offering from AWS and they enable customers to get up to 72% discounts compared to pay-as-you-go pricing.

2. THEY'RE SIMILAR TO AN EXISTING DISCOUNT PROGRAM, BUT OFFER MORE FLEXIBILITY

Savings Plans are unique in that they offer greater flexibility than any previously offered discount program from AWS. This means discounts can extend across Regions and different flavors of infrastructure. This means it will cost less to support business initiatives in new locations and won't stifle engineering innovation if they need to make a change in their architecture.

3. LIKE THE EXISTING DISCOUNT PROGRAM, EFFECTIVE PLANNING AND ACTIVE MANAGEMENT IS ESSENTIAL.

Even though Savings Plans are more flexible than other discount programs, they still require significant upfront planning and ongoing management in order to ensure you get the maximum benefit. Cloud Management Platforms such as CloudHealth can help with both planning and ongoing management of Savings Plans.

8 Ready To Buy Savings Plans? Take These 5 Steps To Ensure Success Plans

In the previous section we mentioned the importance of effective planning and active management. These are the two most important considerations when you feel you are ready to buy AWS Savings Plans to ensure you purchase the right type of Savings Plan and avoid wasting money. Taking the following five steps will ensure you get the maximum benefit of AWS Savings Plans:

STEP 1: DETERMINE YOUR SAVINGS PLAN STRATEGY

Your Savings Plan strategy will likely be determined by how predictable your compute infrastructure and architecture is—how often are teams changing EC2 family types and Regions? Are you considering adding Fargate into the mix? Another key factor to consider is how much capital there is available to make an upfront payment. Or, instead of making the purchase based on a budget, you may decide to base your purchase on a projected coverage rate (e.g., 70% of my total running instance hours in a month should be covered by either Savings Plans or Reservations). You also need to decide how often you'll be making your purchases, is it monthly, quarterly, or continuously? Best practice is to purchase continuously, as needed. Lastly, will you be making delegated or centralized purchases? Because Savings Plans will have affinity to the account in which they were purchased, it's an important consideration. Best practice is typically to purchase from the consolidated master account. Thereafter you need to consider how many of your existing resources will still be required in one or three years (remember, you can always add, but you can't subtract).

STEP 2: RIGHTSIZE YOUR EXISTING INFRASTRUCTURE

Prior to purchasing any type of committed use discount program, cloud infrastructures need to be optimized—otherwise part of the discount will be used to discount cloud waste. Before making any kind of commitment, it's critical to ensure you have the most effective instance to meet the technical requirements of the given workload.

This process is called Rightsizing and involves analyzing the CPU, memory, network, and disk consumption of your workload over time, to understand if it might fit in a smaller instance. If you're purchasing EC2 Instance Savings Plans, you also need to ensure that you're making an investment in the right Instance Family.

8 Ready To Buy Savings Plans? Take These 5 Steps To Ensure Success Plans *(continued)*

STEP 3: ANALYZE AND OPTIMIZE RESERVATIONS

If you have existing investment in Reserved Instances, it's important to optimize your existing RI fleet by modifying Standard Zonal RIs and exchanging Convertible RIs where necessary in order to accurately determine how much Savings Plan coverage is required.

Optimizing your existing RI fleet will help you better analyze and understand RI usage. A solid understanding of how and where EC2 instances are being used will enable you to take advantage of the maximum saving plans discounts available through the EC2 Instance Savings Plans.

STEP 4: PURCHASING AWS SAVINGS PLANS

AWS Savings Plans can be purchased within AWS Cost Explorer or via API (*). The process is straightforward and similar to purchasing RIs with the exception that, if you're purchasing a Savings Plan with a partial upfront payment, the amount of the partial upfront payment isn't fixed by default and must be entered manually (between 50% and 99%).

(*) Mission can help businesses purchase and manage AWS Savings Plans and RIs.

STEP 5: CONTINUOUSLY MONITOR SAVINGS PLANS PURCHASES

AWS Savings Plans should be continuously monitored to ensure they aren't being underused—remember that Savings Plan discounts are use-it or lose-it on an hour by hour basis. Not only that, but you'll be billed at your commitment level, whether or not you've consumed resources. . Additionally, over time, your On-Demand usage will start to creep back up, which would necessitate an additional Savings Plan purchase. Best practice is to keep your On-Demand usage to 20-30% of your total EC2 consumption. Many companies will set a cadence for purchasing Savings Plans once a month, once a quarter, or once a year. However, the best approach is to continuously evaluate opportunities to purchase new Savings Plans. You should also keep an eye out for existing Savings Plans and Reservations that are going to expire.

Where To Get More Information About AWS Savings Plans

If you have further questions about AWS Savings Plans, or would like to see how Mission uses the CloudHealth platform to help businesses take full advantage of them, get in touch with our cost optimization experts. Our team of Cloud Analysts will be happy to guide you through AWS Savings Plans and Reserved Instances to explain the benefits of using CloudHealth to manage your AWS environment.

CONTACT MISSION

855-647-7466 | www.missioncloud.com | info@missioncloud.com

ADDITIONAL MISSION RESOURCES

What is an AWS Savings Plan – Why do You Need One?

Comparing AWS Savings Plans and Reserved Instances

EC2 Spot Instances vs. AWS Savings Plans: What are the Potential Savings?

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