



# **BUYER'S GUIDE TO AWS AND AZURE RESERVED INSTANCES**

Maximizing RI Cost-Saving Potential

“For the right workloads, those that are predictable and stable, utilizing reserved instances on either Azure or AWS is an excellent strategy to reduce and limit unexpected cloud costs.”

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## OVERVIEW

In November 2017, Microsoft announced the launch of Azure Reserved Virtual Machine Instances – a discounted alternative to its standard on-demand pricing system. The new offering works on the same principle as AWS Reserved Instances, allowing you to purchase advance cloud compute capacity at a significantly lower cost than pay-as-you-go prices.

Just like its AWS counterpart, the Azure Reserved Instance model is an attractive proposition for steady, predictable cloud-based workloads and can play a key role in an enterprise cloud cost optimization strategy.

But, while both Reserved Instance offerings are a cost-effective solution in many use cases, they present an additional layer of complexity to cloud cost management.

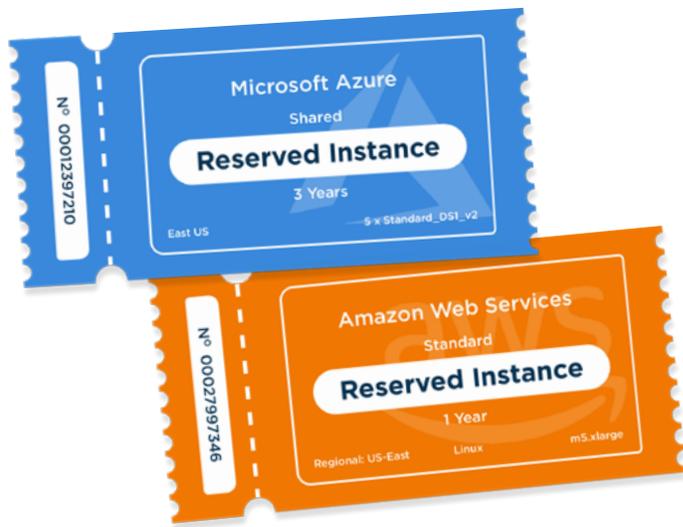
You'll need to understand how they work, when to use them, how to make informed Reserved Instance purchases and how to exploit their cost-saving potential.

In this paper, we run through the essentials of AWS and Azure Reserved Instances, compare and contrast their features, look at their use cases and explore strategies for effective lifecycle management.

## WHAT ARE RESERVED INSTANCES?

Reserved Instances are a financial commitment to discounted compute capacity over a fixed period of one or three years.

The key common feature of both AWS and Azure versions is that they're a billing construct rather than a physical instance, where you effectively purchase a credit against the machine type you specify. This automatically covers the cost of running a virtual machine (VM) that matches the scope and attributes of your reservation.



**FIGURE 1:**

**Reserved Instances work like a coupon, which automatically covers the cost of running a machine that matches the scope and attributes of your reservation.**

AWS and Azure offer potential savings of up to 75% and 72% compared with the price of their respective on-demand instances. The exact level of discount depends on a range of factors, such as the type of instance, length of term and the cloud region in which the instance resides.

However, when you purchase a reservation, you pay for that capacity whether you use it or not. So, to get maximum return on your investment, you should utilize your Reserved Instances as much as possible—as any unused credit goes to waste.

## Reserved Instance Sharing

Both vendors give you the option to share Reserved Instances so that some or all of your accounts can potentially benefit from them. This can help your organization make better use of your reservations and reduce its cloud costs as a whole.

In the case of AWS, the account that bought the reservation is always first in line to the discount. But, if there's no active qualifying machine in the purchaser's account, it automatically applies the credit to a matching instance in another account in the same billing family.

The scope of a shared Azure Reserved Instance depends on whether you're a pay-as-you-go (PAYG) or enterprise customer. For PAYG customers, shared reservations apply to all PAYG subscriptions created by the account administrator. For enterprise customers, the discount is shared across the enrollment and includes all subscriptions within the enrollment.

Some cloud customers may choose to turn Reserved Instance sharing off, where you restrict their scope to just the account that purchased them. This not only gives individual business units more independence and control over their purchasing strategies, but also simplifies billing and cost allocation of Reserved Instance credits.

## DIFFERENCES BETWEEN AWS AND AZURE

Although AWS and Azure Reserved Instances share many similarities, they are different in a few important ways. So let's look at some of their distinguishing features:

### AWS

AWS Reserved Instances are a more established and sophisticated offering with a wealth of purchasing options. These give customers a choice between:

- › Fixed long-term commitments in exchange for larger discounts
- › High levels of flexibility but lower potential savings

In terms of flexibility, the vendor classifies reservations as either Standard or Convertible Reserved Instances. It also offers an additional type of reservation, Scheduled Reserved Instances, designed for recurring use on a daily, weekly, or monthly basis.

#### Standard Reserved Instances

Standard Reserved Instances offer the highest levels of discount. However, once you've specified the attributes of your reservation at the time of purchase, they're pretty well set in stone.

You can't exchange the standard version for a different instance family, operating system (OS), tenancy or payment option—although you can change regionally scoped reservations to a specific Availability Zone or vice versa. You can also switch between EC2-VPC and EC2-Classic network types and assign a reservation to another Availability Zone in the same region.

Finally, if your OS is a free version of Linux then you can modify your instance size, as well as combine and split reservations with the same start/end hour.

#### Convertible Reserved Instances

Convertible Reserved Instances are a more flexible alternative to standard reservations. But this comes at a trade-off, whereby the maximum possible saving is lower at 45%.

You can change to a different instance family, OS or tenancy, provided the exchange is of equal or greater value. This offers a safety net in the event you reserve too much capacity or an IT project is canceled.

## Scheduled Reserved Instances

With Scheduled Reserved Instances, you purchase capacity only for recurring time slots rather than continuously throughout the term of your reservation. This makes them a cost-effective way to host applications with regular workload patterns, such as peak activity during working hours and quiet periods during evenings and weekends.

Scheduled Reserved Instances are available on a one-year term only and must be reserved for a minimum of 1,200 hours. They're currently supported by just a limited range of instance families—C3, C4, C5, M4 and R3.

The following are three other important characteristics of AWS Reserved Instances:

- › **Availability:** You can scope AWS Reserved Instances to either a region or Availability Zone. Regionally scoped reservations cover the cost of any matching instance in a region but don't provide any promise of availability. However, those scoped to just an Availability Zone come with priority access to spare EC2 capacity.
- › **Payment options:** You can (i) pay for the entire term of reservation upfront (ii) pay in installments or (iii) pay partially upfront and settle the remainder over the course of the term. The more you pay upfront, the greater the discount you can expect.
- › **Cancellation:** You cannot cancel a Reserved Instance. So, if you no longer need it, your only option is to sell it on the AWS Reserved Instance Marketplace.



### Volume Discounts

If you spend \$500,000 or more on active Reserved Instances in a single region, you automatically receive a volume discount of 5%, which increases to 10% if you spend more than \$4,000,000.

The discount for each tier applies to all subsequent Standard Reserved Instance purchases in the region in which you've reached the qualifying expenditure threshold.

In addition to EC2 Reserved Instances, AWS also provides a similar system on a number of its other products, including **Relational Database Service (RDS)**, content distribution network (CDN) **CloudFront** and NoSQL database offering **DynamoDB**.

## Azure

As a relatively new offering, Azure Reserved Instances are a lot simpler than their AWS counterparts. They also have a high degree of flexibility automatically built in.

If your compute requirements change, you can exchange your Reserved Instance for a reservation in a different region or VM family, where you effectively cancel it and purchase a new one. Your prorated refund is put towards the new purchase price.

- › **Availability:** Azure Reserved Instances come with priority access to machines that match the attributes of your reservation. However, this doesn't necessarily mean guaranteed availability.
- › **Payment options:** Currently, you can only purchase reservations by means of a single upfront payment.
- › **Cancellation:** By contrast with AWS, you can cancel a reservation. Although this is subject to an early termination fee of 12%, it could prove a deal breaker to customers concerned about the risk of such long-term financial commitments.

Side-by-Side Comparison of AWS and Azure Reserved Instances			
	AWS Standard	AWS Convertible	Azure
<b>Term</b>	1 or 3 years	1 or 3 years	1 or 3 years
<b>Payment options</b>	Upfront, partial or no upfront	Upfront, partial or no upfront	Upfront only
<b>Reserved Instance sharing</b>	Yes	Yes	Yes
<b>Exchange options</b>	Availability Zone, instance size and networking type only	Full flexibility	Full flexibility
<b>Cancellation</b>	No	No	Yes
<b>Priority access to spare capacity</b>	Only when scoped to an Availability Zone	Only when scoped to an Availability Zone	Yes
<b>Auto scaling support</b>	Yes	Yes	Yes
<b>Maximum discount *</b>	75%	54%	72%

\* According to vendor



## Azure Hybrid Use Benefit

With Azure Hybrid Use Benefit, you can use your on-premise Windows Server licenses to reduce the cost of Azure VMs running the same OS. As a result, you only pay the base compute rate of the VM rather than the full cost of the machine.

This discount also applies to Reserved Instances, increasing the potential savings over standard on-demand prices to a maximum of 82%.

## RESERVED INSTANCE USE CASES

### Steady, Predictable Workloads

Purchasing reservations requires careful analysis and realistic forecasting. Above all, this means knowing which applications will benefit from Reserved Instances and which ones won't.

So start by identifying workloads with consistent resource consumption, as these are prime candidates for making continuous use of Reserved Instances throughout their term.

You should also consider using reservations to cover baseline capacity in AWS auto scaling groups or Azure VM scale sets, whereby you set a minimum number of instances below which the size of your cluster should never fall.

### Emergency Spare Capacity

A decision to purchase Reserved Instances may not directly come down to cost.

For example, you may need to reserve capacity as standby infrastructure in the event of a disaster recovery scenario. In the case of AWS, this means you'll need to purchase Reserved Instances scoped specifically to an Availability Zone.

Similarly, if your cloud vendor suffers a regional outage, customers will be scrambling for spare capacity in other cloud regions. So it may pay dividends to have reservations in another cloud region to ensure you get priority access to remaining resources.

## Simpler Cost Management

The fixed payment model of Reserved Instances makes it easier to set budgets and make financial forecasts. As a result, it can prove a particularly useful tool in the use it or lose it spending culture of the public sector, helping federal agencies to align monthly IT costs to budget burndown rates.

## HOW TO MANAGE YOUR RESERVATIONS

The first step to effective Reserved Instance management is understanding how reservations work and when to use them. Next comes the part of delivering their maximum savings potential.

This requires a clear overview of your Reserved Instance inventory in order to identify those that are either unused or underutilized. In addition, you'll need full visibility into resource consumption across your deployments, so you can realign workloads and get the best fit for the instances you've reserved.

In other words, your ultimate goal is to match your Reserved Instances with workloads that make continuous use of them—or make as much use of them as possible.

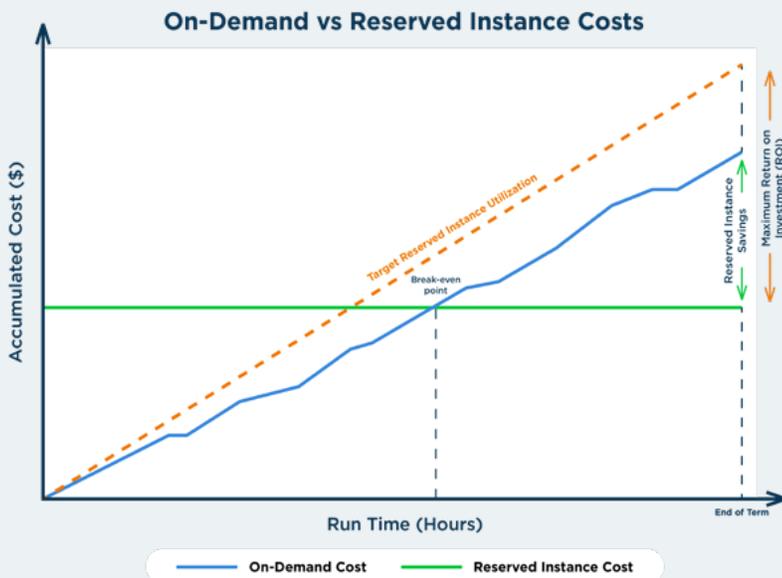


FIGURE 2:

In the illustrative example above, the blue line represents the accumulated on-demand cost of running a VM, while the green line shows the equivalent cost if it were covered by a Reserved Instance. The red line is the target utilization of this instance, which makes continuous use of the reservation in order to achieve maximum return on investment (ROI).

This is where Reserved Instance sharing can make such a difference, as it opens up your reservations to a much larger pool of prospective matches.

But here's the catch.

An individual business unit may want to procure a reservation to reduce the cost of running its own applications. However, other accounts or subscriptions can potentially benefit from that discount.

This presents a challenge to cost allocation, where you'll need to reapportion the charges shown in your consolidated bills to reflect the intended purpose of each reservation. And this can be a huge headache for a large-scale enterprise with an extensive portfolio of accounts, resources and Reserved Instances.

So what's the answer?



You can learn more about the approaches you can take to correctly apportion AWS Reserved Instance costs in our blog post [Amazon RI Demystified: How to Allocate Costs of Your Reserved Instances.](#)

## THE KEY TO RESERVED INSTANCE SUCCESS

Managing your reservations is a complex and time-consuming process. But with the right tools you can stay on top of your Reserved Instances and significantly reduce your monthly cloud bills.

With a fully featured cloud cost management solution you can maintain visibility and control over a complex array of Reserved Instances and dynamic cloud resources. You can keep track of unused and underutilized reservations and rebalance them to more suitable workloads. What's more, you can provide financial teams with cost allocation reports and clear insights into spending across your cloud environment.

And, finally, some tools also offer purchase recommendations—along with a full review of your savings. That way, you can measure the success of your Reserved Instance strategy.

But cloud cost optimization software not only helps you keep your cloud costs down. Time is money. So it also makes good business sense to use a solution that does all the hard work for you.

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