A Beginner's Guide to Microsoft Azure Reserved Virtual Machine Instances

Get Started

Understanding Reserved Virtual Machine Instances

It’s all very simple, really

Microsoft Azure offers three different purchasing options for compute resources: pay as you go (PAYG), where you pay full price; Batch, where you purchase low-priority virtual machines (VMs) at a reduced price compared with normal VMs; and Reserved, where you make all-upfront or monthly payments for the cost of the VM. Azure Reserved Virtual Machine Instances support Linux, Windows, SQL Server, Oracle and more. To put it simply, when you purchase an Azure reservation, you’re essentially purchasing a coupon.

Azure Reserved VM Instances allow you to make a commitment to utilize specific VM instance types in return for a discount on your compute costs. The benefits? Savings and prioritized capacity. A reservation consists of six components:

- Subscription (Enterprise Agreement [EA] or PAYG)
- Single resource group scope, single subscription scope, shared scope, or management group
- Location (select the region)
- VM size (e.g., D2as v5)
- Term (1 or 3 years)
- Quantity (number)

Additionally, Microsoft allows you to achieve a greater cost savings by leveraging Reserved VM Instances combined with the Azure Hybrid Benefit. The Azure Hybrid Benefit covers the cost of the Windows OS on up to two VMs per license, so you only have to pay for the base compute costs.

Table 1: Reserved VM Instance discounts[1]

	1 year reserved	3 year reserved	3 year reserved with Azure Hybrid Benefit
Discount range	19–55%	31–66%	63–86%

1. Based on Windows OS in the East U.S. region.

Pro tip

Enterprise Agreement customers will have reservation purchases deducted from their monetary commitment balance.

Pay-as-you-go customers will be billed for the reservation upon purchase.

Because reservations are a pricing discount applied to any VM instance usage of a specific type (e.g., D2as v5 in East U.S. running Windows), you will be billed at a discounted percentage rather than the base PAYG amount. In other words, by giving Microsoft a heads-up, they give you a discount. Microsoft evaluates the available reservations and running instances on an hourly basis, and then randomly applies reservations to usage. Each usage of a VM instance for the hour gets evaluated to determine if there is an applicable reservation to cover it. Table 2 shows an example comparison of D2as v5 pricing.

Table 2: Reservation pricing comparison[2]

Instance	OS	PAYG price	1 year reserved	3 year reserved	3 year reserved with Azure Hybrid Benefit
D2as v5	Windows	$0.178/hour	$0.1427/hour (~20% savings)	$0.1247/hour (~30% savings)	$0.0327/hour (~62% savings)

Reservations are both a powerful feature and a possible source of confusion for customers. The confusion is often driven by customers purchasing reservations for a specific purpose (e.g., the marketing department), only to find the cost benefit is applied elsewhere.

2. Based on the East U.S. region.

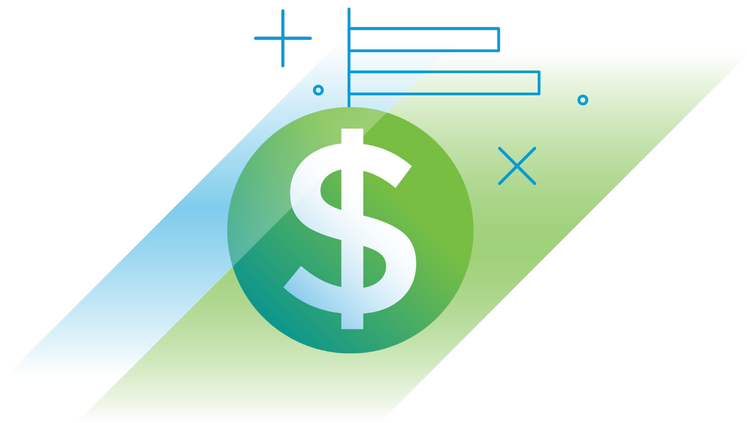
Key questions to consider

- What percentage of my virtual machines do I expect will be running one year from now? Three years from now?
- How likely are the virtual machines to stay within their current region?
- How likely am I to change the virtual machine size (e.g., switching from D2 to D4)?

Making a commitment

Don’t be afraid to just go for it

All organizations concerned with their spend in the cloud need to be looking at reservations. We use what’s called the payback period to calculate the exact number of months it would take before you see a price benefit, assuming 100 percent usage. This metric is invaluable for mitigating the risks of reservations by identifying how long you must actually use them before they break even. The payback period is calculated by comparing the cash outlay for pay-as-you-go usage and the proposed offering over each month in a term, and then identifying the month at which the cost for the on-demand instance usage exceeds the cost for the reserved offering.



You can calculate your break-even point by calculating the savings compared to pay-as-you-go pricing. For example, if you purchase a memory-optimized VM, such as an E8 v3 running Windows in the East U.S. region, the annualized cost of running it 24x7x365 with PAYG is approximately $7,905.60 ($658.80 per month x 12 months in a year). If the instance runs continuously throughout the year, and if you had purchased a one-year reservation for that machine, the cost would be $5,972.52 ($497.71 per month x 12 months in a year). The difference is 24 percent savings.

Here’s the reality: The one-year term reservation for an E8 v3 will break even after 9 months. This is when you can shut down a VM and still benefit from the reservation’s pricing discount. For a three-year reservation, the break-even point occurs around 23 months. For a three-year reservation with the Azure Hybrid Benefit, the break-even point usually occurs after 8 months. If you are running Windows OS, the most cost-effective option is the three-year reservation with the Azure Hybrid Benefit.

Figure 1 shows that an E8 v3 running Windows in the East U.S. region will cost 78 percent less per month with a three-year all-upfront reservation and the Azure Hybrid Benefit.

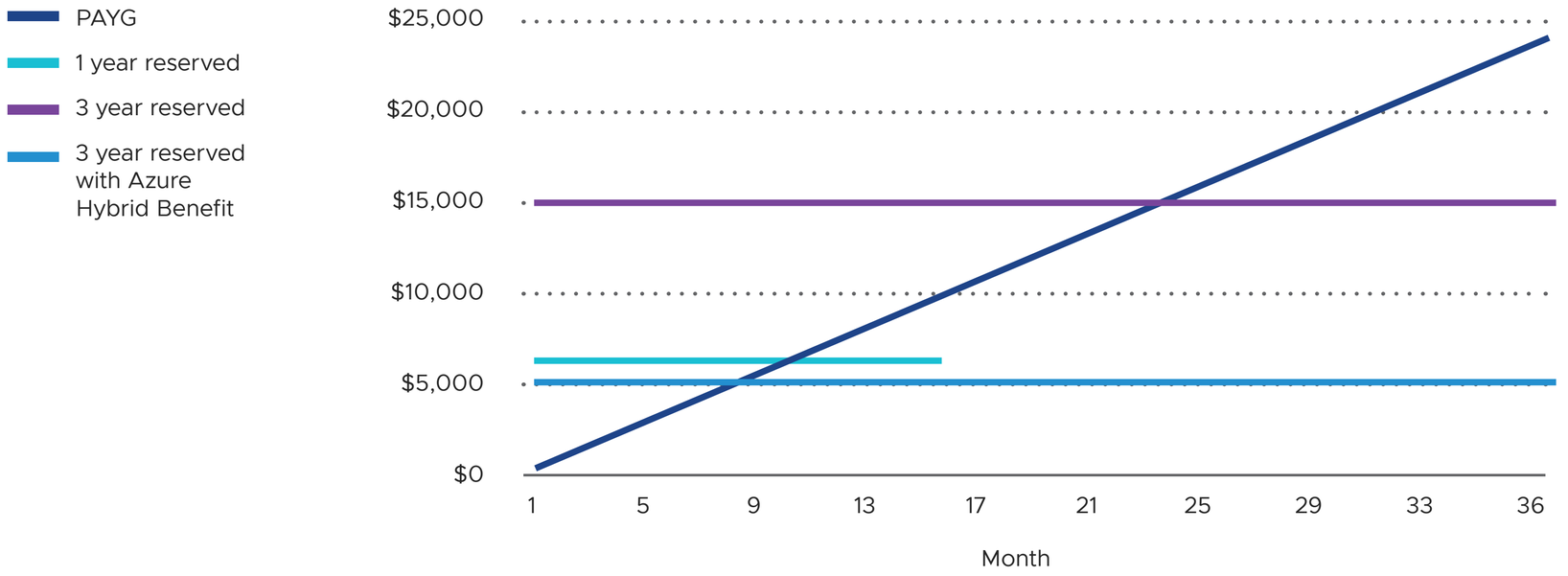


Figure 1: Reservation pricing comparison of an E8 v3 running Windows in the East U.S. region.

Get involved

Reserved Instances put you back in control—enjoy it

Microsoft has different costs for different types of virtual machines (e.g., Windows, Linux) that can be launched, and each type has different pricing. At any reasonable scale, purchasing reservations on a per-VM basis will be almost certainly unmanageable, so group your VMs based on one or more topics (e.g., environments, function, application) so you can evaluate the cost by group.

Once you have grouped your infrastructure, focus on the most expensive group first. Because Reserved VM Instances are really targeted at always-on infrastructure, you can choose to not evaluate groups whose infrastructure is only on 65 percent (or less) of the time.

Before making a purchase, you will also need to identify where your reservations will live within each group you want to purchase. Your decision really comes down to simplifying the purchase in comparison to maximizing the cost and capacity benefit of the purchase. The general best practice is to purchase reservations where you have specific usage. Microsoft enables you to modify your reservations in the following ways:

- Changing the scope from single subscription to shared, or vice versa
- Exchanging Reserved VM Instances across any region and series
- Canceling your Reserved VM Instances at any time for an adjusted refund

When you purchase Reserved VM Instances, you are required to select a quantity; for example, 20 VM instances in one purchase. After this purchase, you may decide to change the scope of half of these Reserved VM Instances. To do this, you must split the reservation into multiple reservations via API/PowerShell or the CLI. For example, you can split the reservation of 20 VM instances into two reservations of 10 VM instances. You can then change the scope of 10 VM instances to Subscription 2, and leave the other 10 as Subscription 1. After splitting reservations, you can also merge reservations from the same order and with the same scope to make them easier to manage.

As of August 2018, Microsoft offers instance size flexibility for Azure Reserved VM Instances. With instance size flexibility, reservation discounts can be applied to different VM sizes in the same size series group. For example, if you buy a reservation for an E16s v3, the reservation can apply to the other sizes in the E2s-64s v3 series group (e.g., E2s v3, E4s v3, etc.). Instance size flexibility automatically applies to any existing reservations with shared scope. This feature needs to be enabled for reservations with a single scope.

In addition to changing the reservation scope, you also have the ability to exchange your reservations across any region and series. With Azure Reserved VM Instances, you can achieve a large potential savings as well as cancel them and receive a prorated refund, minus a 12 percent termination fee, for the remaining months of the reservation, thereby decreasing underutilization. Now you just have to go for it.

Navigating reservation scope

When purchasing a reservation, Microsoft offers several scope options, such as single subscription or shared. The scope you select will determine how many subscriptions can leverage the benefit and how the Reserved VM Instance is applied to those subscriptions. To help you determine which scope makes sense for you, here are some guidelines:

- Use single subscription scope if you want to have reserved compute capacity for the selected subscription.
- Use shared scope if you want reservations to be able to float across your entire Azure account.

Modeling your purchase

Maximize opportunities to save

The goal of any scaling organization is to identify patterns in usage that translate into time- and money-saving efficiencies. But when you're dealing with billions of data points across multiple systems, where do you begin?

Using VMware Tanzu CloudHealth®, you can easily model a purchase for specific subscriptions, regions (e.g. East U.S.), or VM series (e.g., DS2). All those billions of data points are tracked, organized and analyzed instantly. You can view your upfront cost, annual and monthly savings, coverage and, perhaps most importantly, your break-even point.

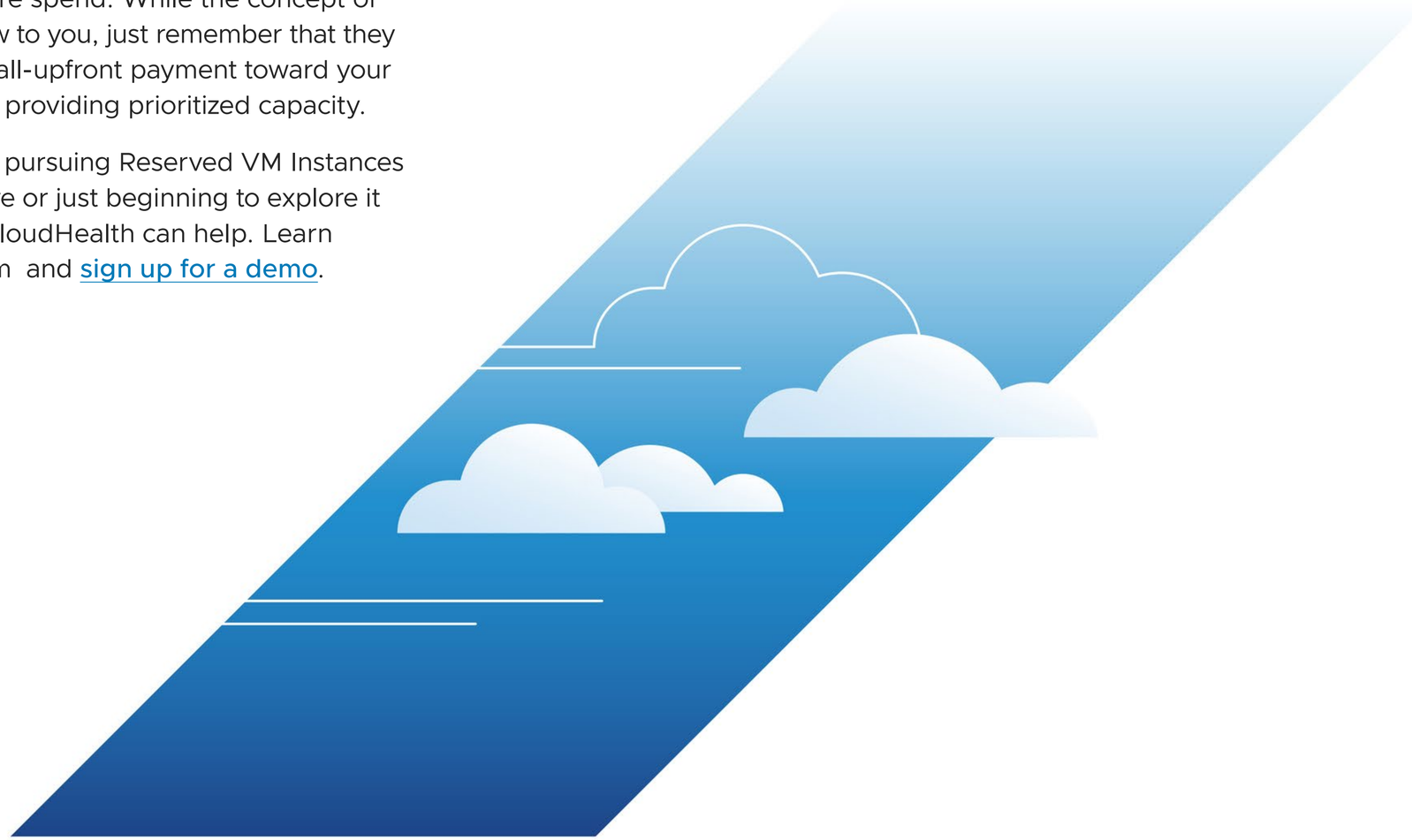
While the recommendations provided from Tanzu CloudHealth will be the optimum for the settings you have configured, you're still in complete control. For example, if Tanzu CloudHealth recommends purchasing 18 Standard DS2 v2 reservations in the East U.S. region for Windows, you can choose to purchase only 9 based on your organizational knowledge of future VM usage
(e.g., you expect a reduction in load that affects this VM type).

Tanzu CloudHealth takes the hassle out of Reserved VM Instance management by providing the modeling, optimization and amortization capabilities needed to help you feel confident about your purchasing decisions.

Conclusion

Microsoft Azure Reserved VM Instances are an effective way to reduce your Azure spend. While the concept of reservations may be new to you, just remember that they enable you to make an all-upfront payment toward your compute costs, thereby providing prioritized capacity.

Whether you're actively pursuing Reserved VM Instances as a cost-saving measure or just beginning to explore it as a possibility, Tanzu CloudHealth can help. Learn more about the platform and sign up for a demo.



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