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

VAST
IT without Limits™

POWERED BY **CloudHealth**

1

UNDERSTANDING RESERVED VIRTUAL MACHINE INSTANCES

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 are paying an all upfront payment for the cost of the virtual machine. Azure Reserved Virtual Machine (VM) Instances have support for 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 virtual machine instance types in return for a discount on your compute costs. The benefits? Savings and prioritized capacity.
A reservation consists of 6 components:

- Subscription (EA or PAYG)
- Scope (Single Subscription or Shared)
- Location (select the region)
- Virtual machine size (e.g. D2 v3)
- 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 virtual machines per licence, so you only have to pay for the base compute costs.

CLOUDOLOGIST TIP

EA (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 at the All Upfront price.

1 Year Reserved	3 Year Reserved	3 Year Reserved with Hybrid Benefit
Discount Range		
19-55%	31-66%	63-86%

Based on Windows OS in East US region

1 UNDERSTANDING RESERVED VIRTUAL MACHINE INSTANCES

Since reservations are a pricing discount applied to any virtual machine instance usage of a specific type (e.g. D2 v3 in East US running Windows), you will be billed at a discounted percentage, rather than the base pay-as-you-go amount. In other words, by giving Microsoft a "head's 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.

For example, here is a comparison of D2 v3 pricing:

Instance	OS	PAYG Price	1 Year Reserved	3 Year Reserved	3 Year Reserved with Hybrid
D2 v3	Windows	$0.192/hour	$0.15/hour (~22%)	$0.13/hour (~33%)	$0.38/hour (~80%)
D2 v3	Linux	$0.10/hour	$0.058/hour (~42%)	$0.038/hour (~63%)	n/a

*Based on East US region

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

KEY QUESTIONS TO CONSIDER

1. What percentage of my virtual machines do I expect will be running one year from now? Three years from now?

2. How likely are the virtual machines to stay within their current region?

3. How likely am I to change the virtual machine size (e.g. switching from D2 to D4)?
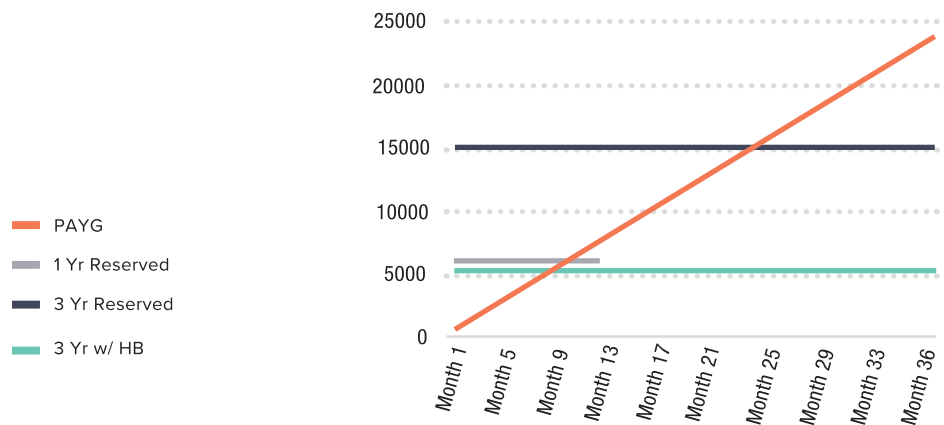
2 MAKING A COMMITMENT

DON'T BE AFRAID TO JUST GO FOR IT.
All organizations who are 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% 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 East US, the annualized cost of running it 24x7x365 with pay-as-you-go 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 $5972.52 ($497.71 per month x 12 months in a year). The difference is a 24% savings.

Here's the reality: the 1 year term reservation for an E8 v3 will break-even after 9 months. This is when you can shutdown a VM and still benefit from the reservation's pricing discount. For a 3 year reservation, the break-even point occurs around 23 months (just under two years). For a 3 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 3 year reservation with the Azure Hybrid Benefit.

We see that an E8 v3 running Windows in the East US region will cost 78% lessper month with a 3-year all upfront reservation and the Azure Hybrid Benefit.

Legend:
- PAYG
- 1 Yr Reserved
- 3 Yr Reserved
- 3 Yr w/ HB

X-axis: Month 1, Month 5, Month 9, Month 13, Month 17, Month 21, Month 25, Month 29, Month 33, Month 36
Y-axis: 0, 5000, 10000, 15000, 20000, 25000

A Beginner's Guide to Microsoft Azure   **www.vastITservices.com**

3 GET INVOLVED

RIS 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 virtual machine basis will be almost certainly unmanageable, so group your virtual machines based on one or more topics (e.g. environments, function, application) so that you can evaluate the cost by group.

Once you have grouped your infrastructure, focus on the most expensive group first. Since Reserved VM Instances are really targeted at "always-on" infrastructure, you can choose to not evaluate groups whose infrastructure is only on < 65% 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 one of simplifying the purchase versus 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.

- Cancelling 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.

3 GET INVOLVED

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 a 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 not only achieve a large potential savings, but you can also cancel them and receive a prorated refund, minus a 12% 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 two "scope" options: 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.

4

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 VAST View™, you can easily model a purchase for specific subscriptions, regions (e.g. East US), or virtual machine 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 VAST View™ will be the optimum for the settings you have configured, you're still in complete control. For example, if VAST View™ recommends purchasing 18 Standard DS2 v2 reservations in the East US region for Windows, you can choose to purchase only 9 based on your organizational knowledge of future virtual machine usage (e.g. you expect a reduction in load that affects this virtual machine type).

VAST View™ 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.

A Beginner's Guide to Microsoft Azure   **www.vastITservices.com**

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 towards 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. Learn more about about the platform by visiting **www.vastITservices.com**

POWERED BY **CloudHealth**
VAST View™ is a trademark of VAST IT Services.

VAST
IT without Limits™