

# Cost optimization in Azure

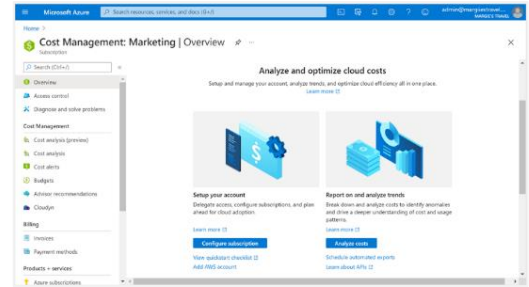
This handout gives an overview of some of the ways that customers can optimize their use of Azure and make cost savings.

## Azure Cost Management

Azure Cost Management gives customers the tools to plan for, analyze and reduce their spending to maximize their cloud investment.

Customers who purchase Azure services through a Volume Licensing agreement, or direct from Microsoft either via [azure.com](https://azure.com) or from an internal salesperson, have direct access to the Azure Cost Management tools in the Azure Management Portal.

When Azure services are purchased through the Cloud Solution Provider program, the CSP partner has access to the Azure Cost Management tools, but can give access to customers if required.

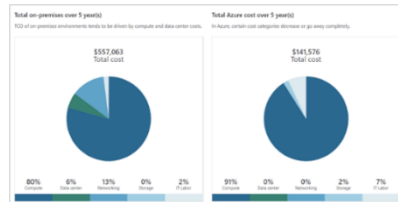


<https://portal.azure.com>

## Azure TCO Calculator

The Azure Total Cost of Ownership (TCO) Calculator helps customers to estimate the cost savings that could be realized by migrating their workloads to Azure, by completing the following steps:

- 1 Supply details of on-premises workloads to enable the tool to understand the current TCO and recommended services in Azure
- 2 Adjust assumptions to reflect a particular industry or location, to give a more accurate TCO report
- 3 View reports to see estimated cost savings with Azure over 5 years



<https://bit.ly/2F1ynp3>

## Azure Pricing Calculator

The Azure Pricing Calculator helps customers configure and estimate costs for the different Azure products that might make up a solution.

It also highlights where additional cost savings may be made – for example, via Reservations or the Azure Hybrid Benefit:



**Savings Options**  
Save up to 72% on pay-as-you-go prices with 1-year or 3-year Reserved Virtual Machine Instances. Reserved Instances are great for applications with steady-state usage and applications that require reserved capacity. [Learn more about Reserved VM Instances pricing.](#)

<b>Compute (E32s v4)</b> <input checked="" type="radio"/> Pay as you go <input type="radio"/> 1 year reserved (-41% discount) <input type="radio"/> 3 year reserved (-62% discount) \$1,635.20 Average per month (\$300 charged upfront)	<b>OS (Windows)</b> <input checked="" type="radio"/> License included <input type="radio"/> Azure Hybrid Benefit \$1,074.56 Average per month (\$300 charged upfront)	<b>Software (SQL Server)</b> <input checked="" type="radio"/> License included <input type="radio"/> Azure Hybrid Benefit \$8,760.00 Average per month (\$300 charged upfront)	<b>Total</b> \$11,469.76 Average per month (\$300 charged upfront)
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<http://bit.ly/AzurePricingCalculator>

## Azure Reservations

Azure Reservations enable a customer to make a 1- or 3-year commitment to an Azure service and get savings of up to 72 per cent.

- Payment can be made upfront or monthly
- Popular Reservations include Reserved Instances for virtual machines, and Reserved Capacity for database solutions

### Azure Reserved Instances flexibility

#### Reassign

- Customers can reassign a Reserved Instance at any time to a different Subscription or Resource/Management Group

#### Exchange

- Customers can exchange one Reserved Instance for another
- The unused duration of the original RI is pro-rated and credit is applied to a new 1 or 3-year term RI

#### Cancel

- Customers can cancel a Reserved Instance at any time
- Refunds are pro-rated with a cancellation fee deducted, although this fee is not currently charged

<b>Virtual machines</b> Save by buying Reserved Instances for 1 or 3 years	<b>Azure Blob Storage</b> Save by buying Reserved Capacity for 1 or 3 years	<b>Azure Database for PostgreSQL</b> Save by buying vCores for 1 or 3 years	<b>Azure Data Explorer</b> Save by buying Reserved Instances for 1 or 3 years	<b>Azure Red Hat OpenShift</b> Save by pre-purchasing plans for 1 year	<b>Data Factory</b> Save by buying Reserved Capacity	<b>SQL Database</b> Save by buying Reserved vCores for 1 or 3 years
<b>Azure Dedicated Host</b> Save by buying Reserved vCores for 1 or 3 years	<b>Azure Managed Disks</b> Save by buying Reserved Disks for 1 year	<b>SUSE Linux</b> Save by pre-purchasing SUSE software for 1 or 3 years	<b>App Services</b> Save by buying Reserved Instances	<b>Azure Synapse Analytics</b> Save by buying Reserved Capacity for 1 or 3 years	<b>Azure Database for MySQL</b> Save by buying Reserved vCores for 1 or 3 years	<b>Azure Databricks</b> Save by pre-purchasing DBUs for 1 or 3 years
<b>Red Hat Plans</b> Save by pre-purchasing plans for 1 or 3 years	<b>Azure VMware Solution</b> Save by buying Reserved Instances for 1 or 3 years	<b>Azure Cosmos DB</b> Save by buying Reserved Throughput Capacity for 1 or 3 years	<b>Azure Database for MariaDB</b> Save by buying Reserved vCores for 1 or 3 years	<b>Azure Cache for Redis</b> Save by buying Reserved Instances for 1 or 3 years	<b>Azure VMware Solution by CloudSimple</b> Save by buying Reserved Instances for 1 or 3 years	<b>Azure Files Reserved Capacity</b> Save by buying Reserved Capacity for 1 or 3 years

## Azure Hybrid Benefit

The Azure Hybrid Benefit is a cost-savings benefit which enables Volume Licensing or CSP customers to bring eligible licenses to Azure to achieve the lowest cost of ownership for Windows Server and SQL Server solutions.

### Windows Server

#### Eligibility

**CSP:** a benefit included with 1 or 3-year Server Subscriptions for Windows Server Standard Core licenses

**VL:** a benefit for Windows Server Standard or Datacenter Core licenses with active Software Assurance

#### Rights to use Windows Server licenses:

- For on-premises physical or virtual servers, OR
- For virtual machines running in Azure



### SQL Server

#### Eligibility

**CSP:** a benefit included with 1 or 3-year Server Subscriptions for SQL Server Standard or Enterprise Core licenses

**VL:** a benefit for SQL Server Standard or Enterprise Core licenses with active Software Assurance

#### Rights to use SQL Server licenses:

- For on-premises physical or virtual servers, OR
- For virtual machines running in Azure, OR
- For the Azure SQL database services

## Azure Spot virtual machines

Azure Spot virtual machines let customers access unused Azure compute capacity at deep discounts compared to pay-as-you-go VM prices. Spot VMs are ideal for workloads that can handle interruptions and don't need to be completed within a specific time frame.

- Customers can choose the maximum price to pay for a Spot VM in advance
- Workloads are evicted when Azure no longer has compute capacity and must reallocate its resources. Customers can choose to deallocate or delete VMs upon eviction, dependent on whether they will be redeployed later



## Constrained core VMs for SQL Server

These virtual machines are optimized for database workloads like SQL Server that often require high memory, storage, and I/O bandwidth, but not a high vCPU core count. They constrain the vCPU count of the virtual machine to reduce the cost of software licensing, all while maintaining the same memory, storage, and I/O bandwidth. The licensing charged for SQL Server is constrained to the active vCPU count while the compute cost, which includes OS licensing, remains the same as the original size based on underlying vCPUs.

For example, for virtual machines in the West US data center:

	E32s v4 (regular)	E32-8s v4 (constrained core)
<b>Cores</b>	32 in total	8 active, 32 underlying
<b>Compute</b>	\$1,635.20	\$1,635.20
<b>Windows Server</b>	\$1,074.56	\$1,074.56
<b>SQL Server</b>	\$8,760.00	\$2,190.00
<b>Total monthly cost</b>	\$11,469.76	\$4,899.76

Prices are identical for the Compute and Windows Server part, but the SQL Server costs are a quarter in the second VM – because a quarter of the cores are being used.

## VM automatic shutdown

The Auto-shutdown feature enables customers to shut down virtual machines during inactive periods, saving money since they only pay for what they use.

