# 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 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
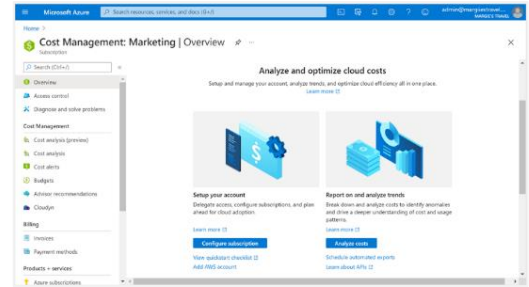
Azure TCO Calculator

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
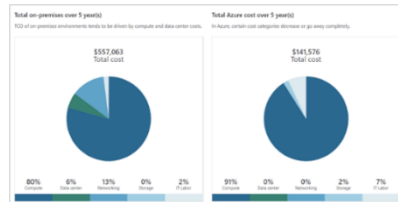
Azure Pricing Calculator

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:

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

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)
Cores	32 in total	8 active, 32 underlying
Compute	$1,635.20	$1,635.20
Windows Server	$1,074.56	$1,074.56
SQL Server	$8,760.00	$2,190.00
Total monthly cost	$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.