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# Azure Arc & Automation

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# Agenda



**Azure Arc Overview**



**Azure Arc Features**



**Azure Arc Pricing**



**Azure Automation Overview**



**Azure Automation Features**



**Azure Automation Pricing**

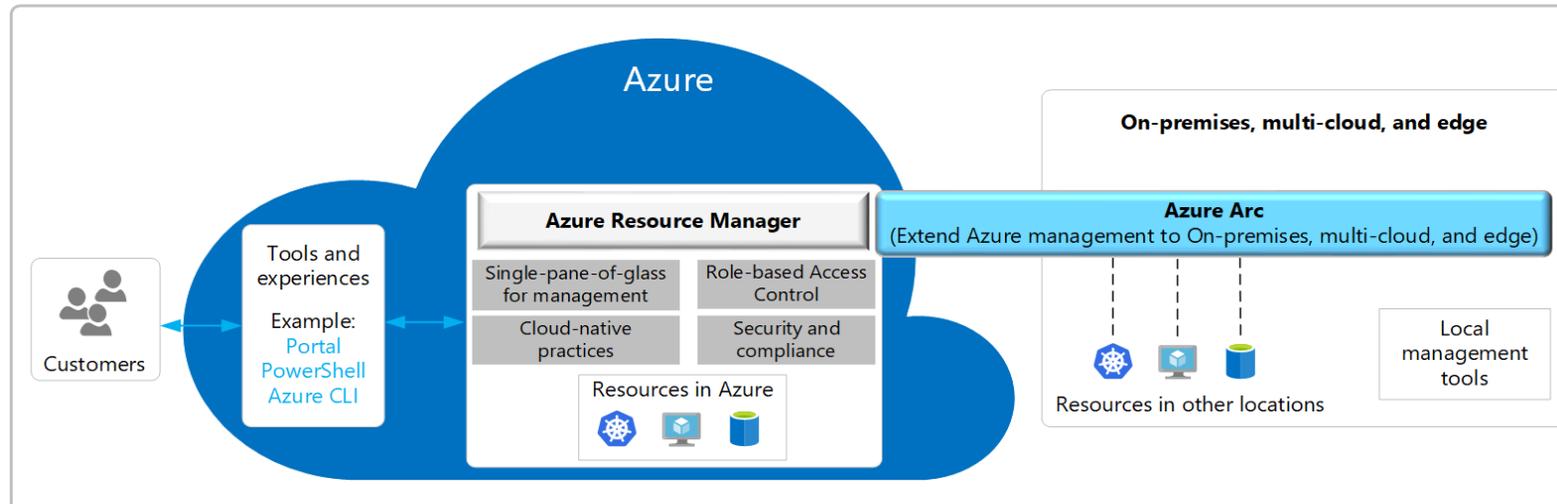
# Azure Arc Overview



# Overview

Azure Arc simplifies governance and management by delivering a consistent multi-cloud and on-premises management platform. Azure Arc enables you to:

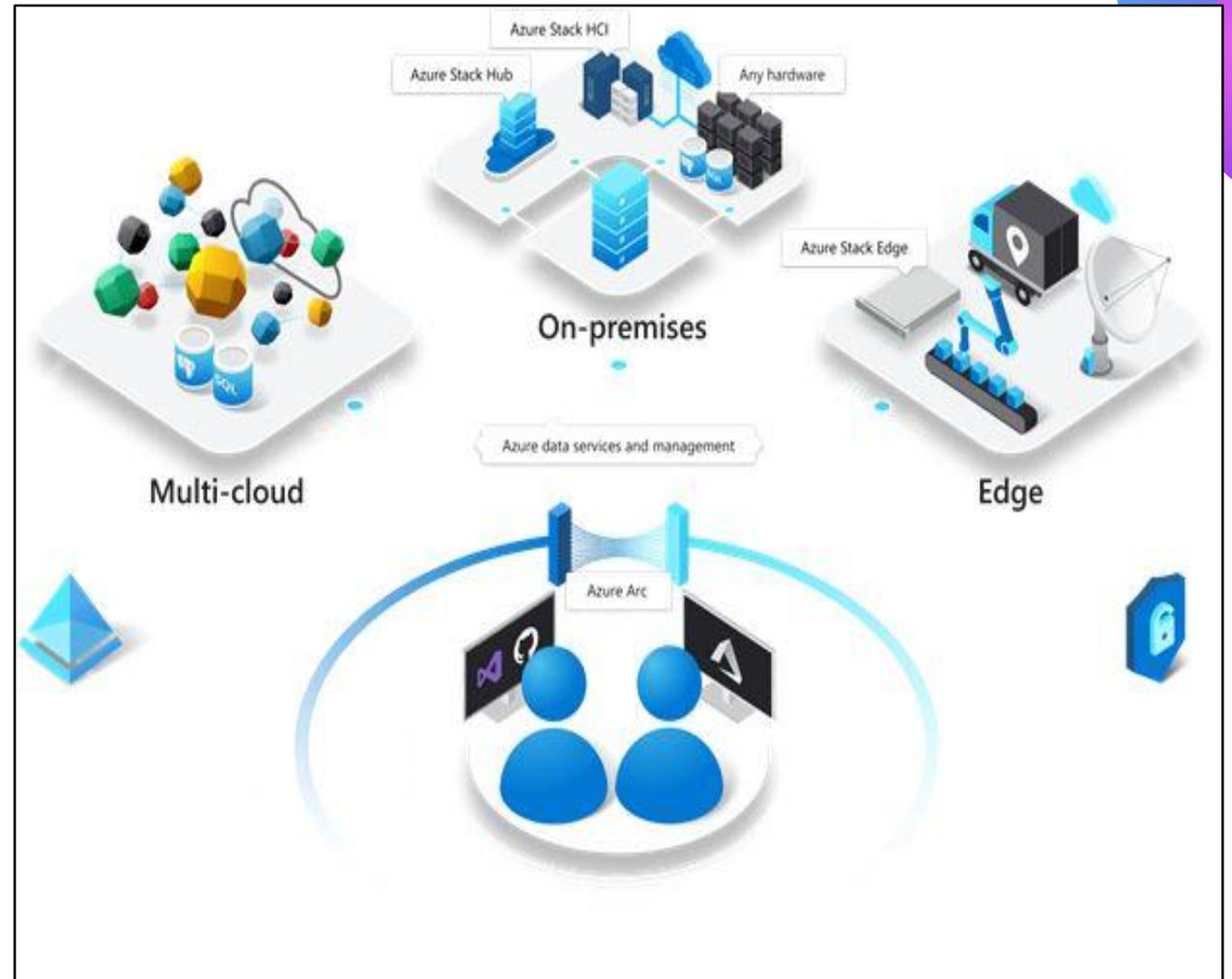
- Manage your entire environment, with a single pane of glass, by projecting your existing non-Azure, on-premises, or other-cloud resources into Azure Resource Manager.
- Manage virtual machines, Kubernetes clusters, and databases as if they are running in Azure.
- Use familiar Azure services and management capabilities, regardless of where they live.
- Continue using traditional ITOps, while introducing DevOps practices to support new cloud native patterns in your environment.
- Configure Custom Locations as an abstraction layer on top of Azure Arc-enabled Kubernetes cluster, cluster connect, and cluster extensions.



# Overview

Today, Azure Arc allows you to manage the following resource types hosted outside of Azure:

- **Servers** - both physical and virtual machines running Windows or Linux.
- **Kubernetes clusters** - supporting multiple Kubernetes distributions.
- **SQL Server** - enroll instances from any location with SQL Server on Azure Arc-enabled servers.



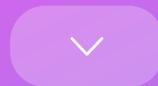
# Overview

## What does Azure Arc deliver?

Key features of Azure Arc include:

- Implement consistent inventory, management, governance, and security for your servers across your environment.
- Integrate virtual machines with Defender for cloud & Microsoft Sentinel.
- Configure Azure VM extensions to use Azure management services to monitor, secure, and update your servers.
- Manage and govern Kubernetes clusters at scale.
- Use GitOps to deploy configuration across one or more clusters from Git repositories.
- Zero-touch compliance and configuration for your Kubernetes clusters using Azure Policy.

# Azure Arc Features



# Azure Arc-enabled Servers

## Supported cloud operations

When you connect your machine to Azure Arc-enabled servers, it enables the ability for you to perform the following operational functions as described in the following table.

**Govern:** Use Azure Policy to govern & audit virtual machines configuration.

### Protect:

- Protect non-Azure servers with [Microsoft Defender for Endpoint](#), included through [Microsoft Defender for Cloud](#), for threat detection, for vulnerability management,
- Use [Microsoft Sentinel](#) to collect security-related events and correlate them with other data sources.

### Configure:

- Use [Azure Automation](#) for frequent and time-consuming management tasks using PowerShell, Assess configuration changes for installed software, Microsoft services, Windows registry and files, and Linux daemons using [Change Tracking and Inventory](#)
- Use [Update Management](#) to manage operating system updates for your Windows and Linux servers.

### Monitor:

- Monitor operating system performance and discover application components to monitor processes and dependencies with other resources using [VM insights](#).
- Collect other log data, such as performance data and events, from the operating system or workloads running on the machine with the [Azure Monitor Agent](#). This data is stored in a [Log Analytics workspace](#).

# Azure Arc-enabled Servers-Cont

To onboard virtual machines to Arc , you need to install the **Azure Connected Machine agent** on each machine. This agent does not deliver any other functionality,

## Supported operating systems:

The following versions of the Windows and Linux operating system are officially supported for the Azure Connected Machine agent:

- Windows Server 2008 R2 SP1, Windows Server 2012 R2, 2016, 2019, and 2022 (including Server Core)
- Ubuntu 16.04, 18.04, and 20.04 LTS (x64)
- CentOS Linux 7 and 8 (x64)
- SUSE Linux Enterprise Server (SLES) 12 and 15 (x64)
- Red Hat Enterprise Linux (RHEL) 7 and 8 (x64)
- Amazon Linux 2 (x64)
- Oracle Linux 7

Home > Azure Arc

## Azure Arc | Servers

Microsoft

Search (Ctrl+/) << + Add Manage view Refresh Export to CSV Open query

Overview All Azure Arc resources

Subscription == 57 of 61 selected Resource gr

Showing 1 to 38 of 38 records.

Management	Name ↑↓	Status ↑↓
Custom locations (preview)	ARC-VM1	
Infrastructure	ARC-VM2	Connected
Servers	ARC-VM3	Connected
Kubernetes clusters	ARC-VM4	Connected
SQL servers (preview)	ARC-VM5	Connected
Azure Stack HCI	ARC-VM6	Expired
Services	contoso-compute1	Expired
Data controllers (preview)	contoso-compute2	Expired

# Azure Arc-enabled Kubernetes

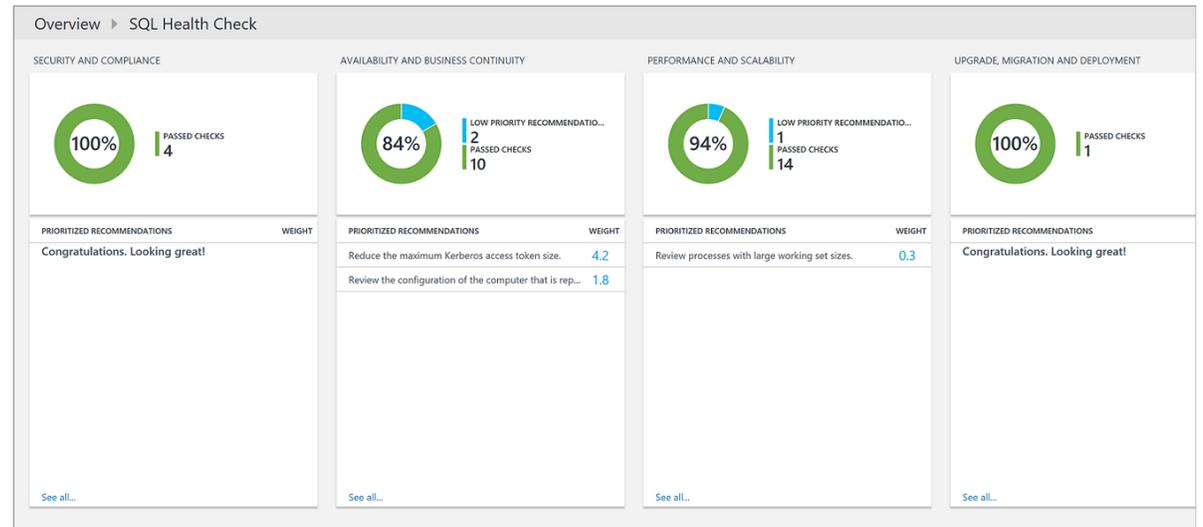
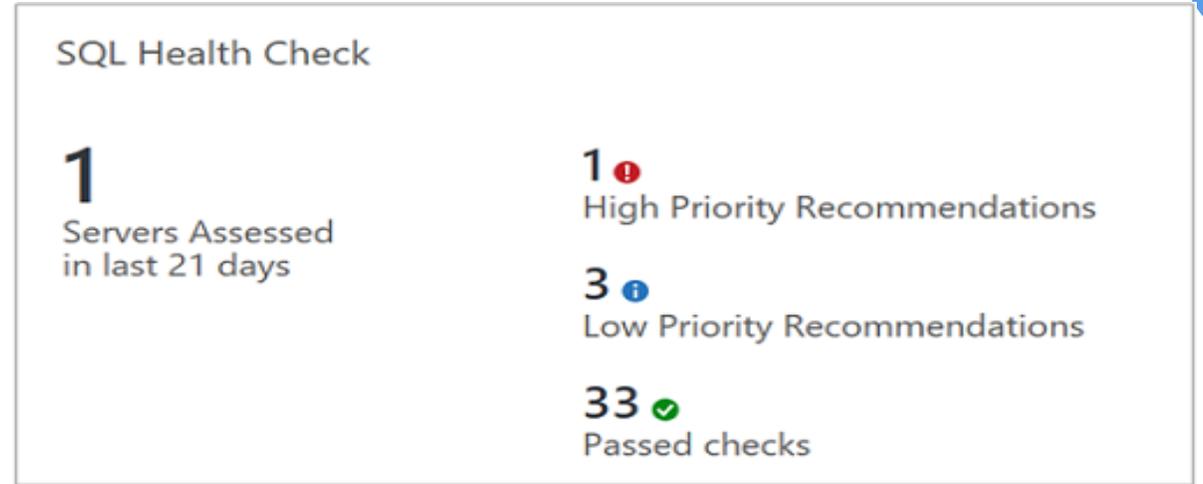
- View all connected Kubernetes clusters running outside of Azure for inventory, grouping, and tagging, along with Azure Kubernetes Service (AKS) clusters.
- Configure clusters and deploy applications using GitOps-based configuration management.
- View and monitor your clusters using Azure Monitor for containers.
- Enforce threat protection using Microsoft Defender for Kubernetes.
- Ensure governance through applying policies with Azure Policy for Kubernetes.
- Grant access and connect to your Kubernetes clusters from anywhere and manage access by using Azure role-based access control (RBAC) on your cluster.
- Deploy and manage Kubernetes applications targeted for Azure Arc-Enabled Kubernetes clusters from Azure Marketplace

# Azure Arc-enabled Data Services

You can use the **SQL Health Check** solution to assess the risk and health of your server environments on a regular interval. This article will help you install the solution so that you can take corrective actions for potential problems

SQL Health Check collects data from the following sources using the agent that you have enabled:

- Windows Management Instrumentation (WMI)
- Registry
- Performance counters
- SQL Server dynamic management view results



# Azure Arc-enabled PostgreSQL Hyperscale

Azure Arc-enabled PostgreSQL Hyperscale is one of the database services available as part of Azure Arc-enabled data services. Azure Arc makes it possible to run Azure data services on-premises, at the edge, and in public clouds using Kubernetes and the infrastructure of your choice. The value proposition of Azure Arc-enabled data services articulates around:

- Always current
- Elastic scale
- Self-service provisioning
- Unified management
- Disconnected scenario support

Select the deployment options

Filter resources...

Categories

- All
- On-premises
- Hybrid
- Cloud
- SQL Server
- PostgreSQL

SQL Server on Windows  
Run SQL Server on Windows, select a version to get started.

SQL Server container image  
Run SQL Server container image with docker

SQL Server Big Data Cluster  
SQL Server Big Data Cluster allows you to deploy scalable clusters of SQL Server, Spark, and HDFS containers running on Kubernetes

Azure SQL Database  
Create a SQL database, database server, or elastic pool in Azure.

SQL Server on Azure Virtual Machine  
Create SQL virtual machines on Azure. Best for migrations and applications requiring OS-level access.

Azure Arc data controller (preview)  
Creates an Azure Arc data controller

PostgreSQL Hyperscale server groups - Azure Arc (preview)  
Deploy PostgreSQL Hyperscale server groups into an Azure Arc environment

I accept Microsoft Privacy Statement and Azure Arc enabled PostgreSQL Hyperscale terms and conditions.

Options

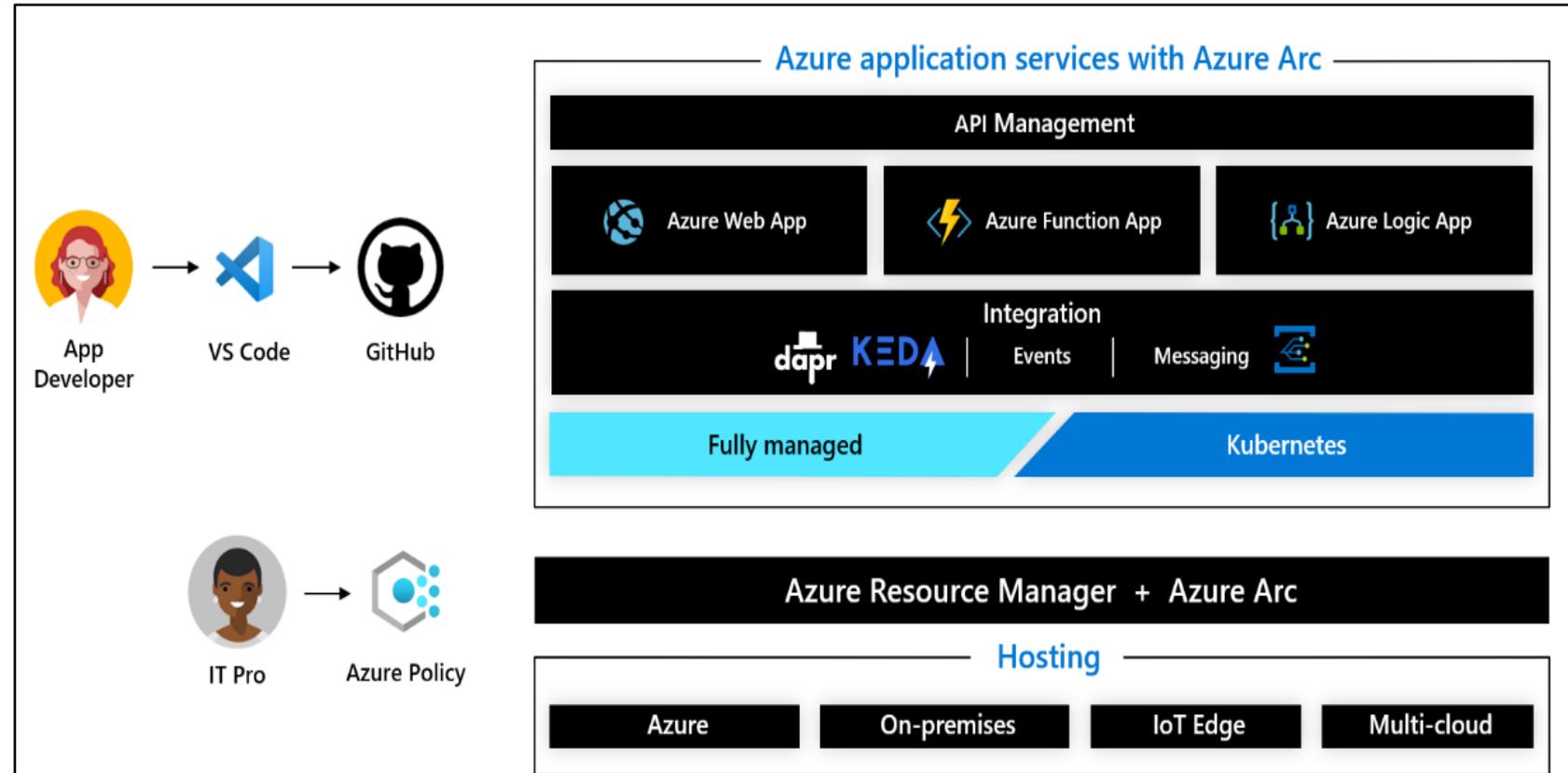
Required tools

Tool	Description	Status	Version	Required Version	Discovered Path or Additional Information
kubectl	Runs commands against Kubernetes clusters	Installed	1.19.0		C:\Windows\kubectl.exe
Azure Data CLI	Azure Data command line interface	Installed	20.2.4	20.2.0	C:\Program Files (x86)\Microsoft SDKs\Azdata\CLI\wbin\azdata.cmd

Select Cancel

# Azure Arc-enabled Application Services

You can run App Service, Functions, and Logic Apps on an Azure Arc-enabled Kubernetes cluster. The Kubernetes cluster can be on-premises or hosted in a third-party cloud.



# Azure Arc-enabled VMware vSphere

**Azure Arc-enabled VMware vSphere** extends Azure governance and management capabilities to VMware vSphere infrastructure. With Azure Arc-enabled VMware vSphere, you get a consistent management experience across Azure and VMware vSphere infrastructure.

## **Arc-enabled VMware vSphere allows you to:**

- Perform various VMware virtual machine (VM) lifecycle operations directly from Azure, such as create, start/stop, resize, and delete.
- Empower developers and application teams to self-serve VM operations on-demand using Azure role-based access control (RBAC).
- Browse your VMware vSphere resources (VMs, templates, networks, and storage) in Azure, providing you a single pane view for your infrastructure across both environments. You can also discover and onboard existing VMware VMs to Azure.
- Conduct governance and monitoring operations across Azure and VMware VMs by enabling guest management (installing the Azure Arc-enabled servers Connected Machine agent).

# Azure Arc Pricing



# Azure Arc Pricing

## Azure Arc enabled servers

In addition to the included capabilities, Azure Update Management is offered for servers outside of Azure at no additional cost. Add-on Azure management services (Azure Policy guest configuration, Azure Monitor, Azure Defender etc.) are charged for Azure Arc enabled servers when enabled

## Azure Policy guest configuration

- Azure Policy guest configuration offers the ability to define and audit compliance configuration of servers in your environment such as password policy, encryption protocols and members of admin group, so that you can track compliance of organizational requirements.
- Billing is based on the number of servers registered with the service and have one or more guest configurations assigned to them. Billing is pro-rated hourly.

Service	Azure Resource	Azure Arc Resource
Azure Control Plane Functionality	Free	Free
Azure policy guest configuration (includes Azure Automation , change tracking , inventory ,state configuration)	Free	\$6/Server/Month

# Azure Arc Pricing

## Azure Arc enabled Kubernetes

Any number of Kubernetes clusters can be connected and organized in the Azure Portal at no additional cost. Like Arc enabled servers, add-on Azure management services, like Kubernetes Configuration, are charged when enabled

### Kubernetes Configuration

- Kubernetes Configuration delivers configuration management and application deployment using GitOps.. The development teams can then use pull requests and the tools they are familiar with (existing DevOps pipelines, Git, Kubernetes manifests, Helm charts).
- Billing is based on the number of vCPUs/hour in the cluster and is charged monthly. Clusters incur a single charge for configuration management no matter how many repositories are connected

Service	Azure Resource	Azure Arc Resource
Azure Control Plane Functionality	Free	Free
Kubernetes Configuration	Free	First 6 VCPUs are free , \$2/vCPU/Month

# Azure Arc Pricing

## Azure Arc enabled data services

SQL Server customers can use Azure Hybrid Benefit to adopt Azure Arc-enabled SQL Managed Instance without the need to pay for SQL license again

## Azure Arc enabled application services

In the current phase, Azure Arc enabled application services are offered at no additional cost.

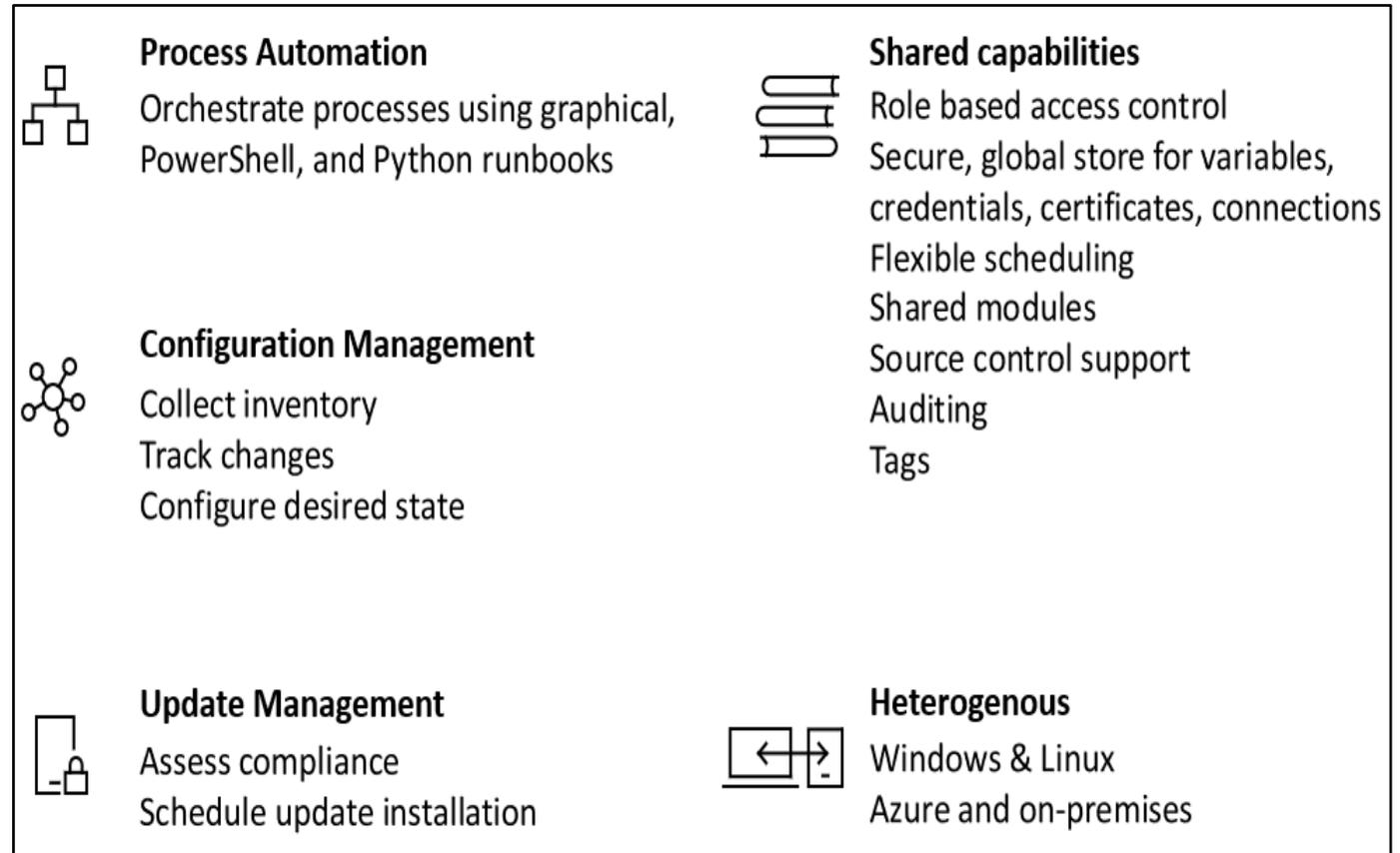
1 vCore / Month	Pay as you go
License Included	\$153.30
Azure Hybrid Benefit*	\$80.30

# Azure Automation

Azure Automation delivers a cloud-based automation and configuration service that supports consistent management across your Azure and non-Azure environments. It comprises process automation, configuration management, update management, shared capabilities, and heterogeneous features. Automation gives you complete control during deployment, operations, and decommissioning of workloads and resources.

## What does azure automation delivers?

- Process automation
- Configuration management
- Update management
- Shared Capabilities



# Azure Automation

## Automation Use Cases :

Azure Automation supports management throughout the lifecycle of your infrastructure and applications.

Common scenarios include:

- **Write runbooks** - Author PowerShell, PowerShell Workflow, graphical, Python 2, and DSC runbooks in common languages.
- **Build and deploy resources** - Deploy virtual machines across a hybrid environment using runbooks and Azure Resource Manager templates. Integrate into development tools, such as Jenkins and Azure DevOps.
- **Configure VMs** - Assess and configure Windows and Linux machines with configurations for the infrastructure and application.
- **Retrieve inventory** - Get a complete inventory of deployed resources for targeting, reporting, and compliance.
- **Find changes** - Identify changes that can cause misconfiguration and improve operational compliance.

# Change Tracking and Inventory

Change Tracking and Inventory makes use of Defender For Cloud File Integrity Monitoring (FIM) to examines operating system and application files, and Windows Registry. While FIM monitors those entities, Change Tracking and Inventory natively tracks:

- Windows software
- Linux software (packages)
- Windows and Linux files
- Windows registry keys
- Windows services
- Linux daemons

The screenshot shows the 'testcloudgateaa | Inventory' page in the Microsoft Defender for Cloud console. The page is for an 'Automation Account'. It features a search bar, navigation links for 'Add Azure VMs', 'Add non-Azure machine', 'Manage machines', 'Log Analytics', 'Edit Settings', and 'Create'. Two summary cards are visible: 'New software' with a count of 0 and 'Machines reporting' with a count of 1, both for the last 24 hours. Below these are tabs for 'Machines(0)', 'Software(693)', 'Files(0)', 'Windows Registry(0)', 'Windows Services(0)', and 'Linux Daemons(185)'. A search bar for filtering items is present above a table with the following data:

Machine	Operating System	Version
cloudgate-web	Linux	Ubuntu 20.04

# Azure Automation Pricing

## Process Automation

Process automation includes runbook jobs and watchers. Billing for jobs is based on the number of job run time minutes used in the month and for watchers is based on the number of hours used in a month. Charges for process automation are incurred whenever a job or watcher runs. You will be billed only for minutes/hours that exceed the free included units.

Service	Free units included (per month)	Price
Job Run Time	500 minutes	\$0.002/minute
Watchers	744 hours	\$0.002/hour

# Azure Automation Pricing

## Configuration management

Configuration management includes the configuration pull service and change tracking capabilities. Billing is based on the number of nodes that are registered with the service and the log data stored in the Azure Log Analytics service.

Charges for configuration management start when a node is registered with the service and stop when the node is unregistered from the service. A node is any machine whose configuration is managed by configuration management. This could be an Azure virtual machine (VM), on-premises VM, physical host, or a VM in another public cloud. Billing for nodes is pro-rated hourly.

Machine Type	Free units included (per month)	Price
Azure Node	N/A	Free
Non-Azure Node	5 nodes	\$6/Node

# Azure Automation Pricing

## Update management

Update management includes visibility and deployment of updates in your environment. There are no charges for the service, you only pay for log data stored in the Azure Log Analytics service.

	Free units included (per month)	Price
Any Node	N/A	Free

# Thank You

