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10th anniversary

Azure Arc-enabled servers

The future of a hybrid management

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PS> whoami

Focus

Azure, PowerShell, speaking, trainings

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Novi Sad, Serbia

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Food

Dark chocolate, chilies

Hobbies

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What is our problem and our goal?

- **Challenge**
- A struggle to control and govern complex and distributed environments
- Across on-premises, multi-cloud, and edge
- Disjointed management tools

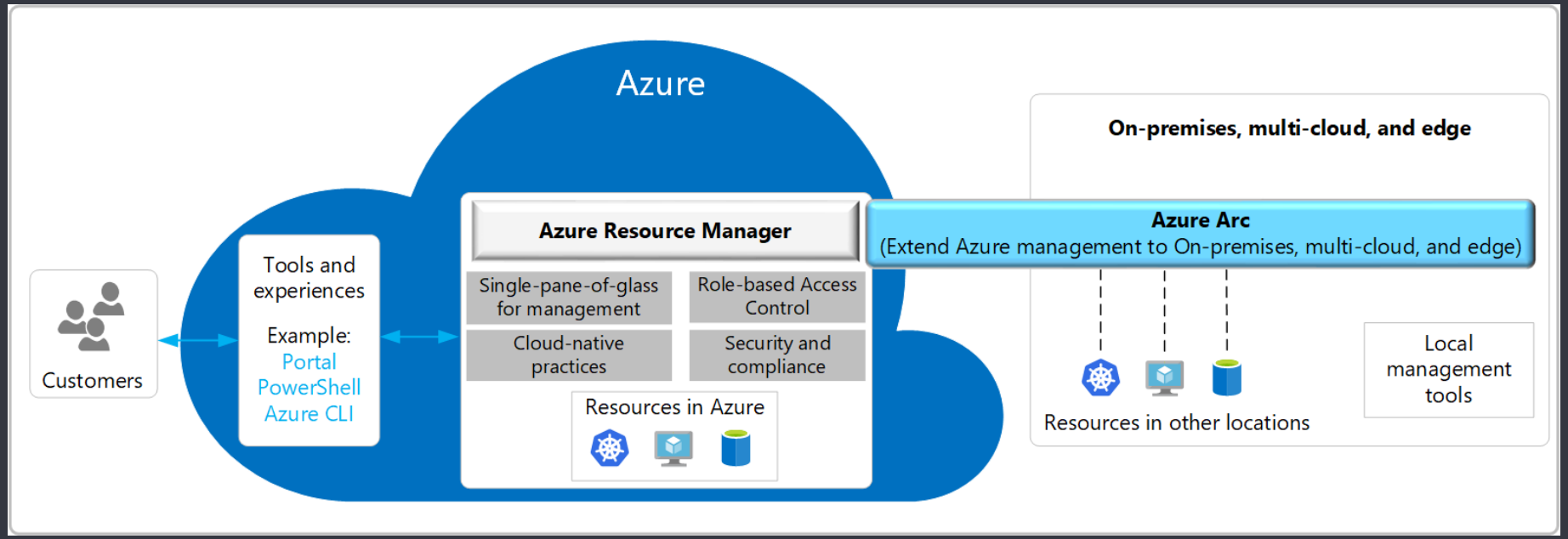
- **Goal**
- Centralized and simplified management
- A consistent multi-cloud and on-premises management platform

How to get there?

- Microsoft's vision: **Azure Arc**

- Enables you to manage your entire environment
- Projecting your existing resources into Azure Resource Manager
- Manage on-premises and other cloud resources as if they are running in Azure

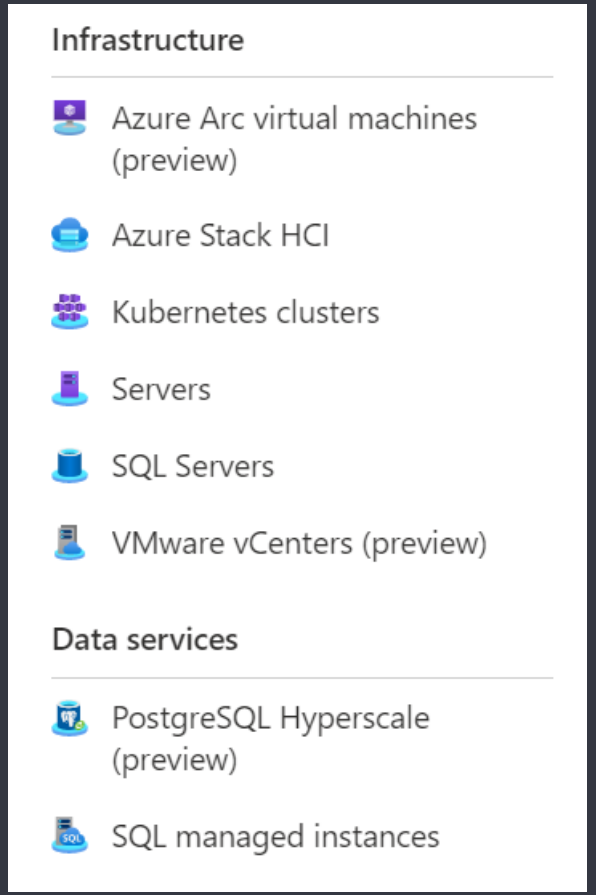
Azure Arc control plane



Source: https://docs.microsoft.com/azure/azure-arc/overview

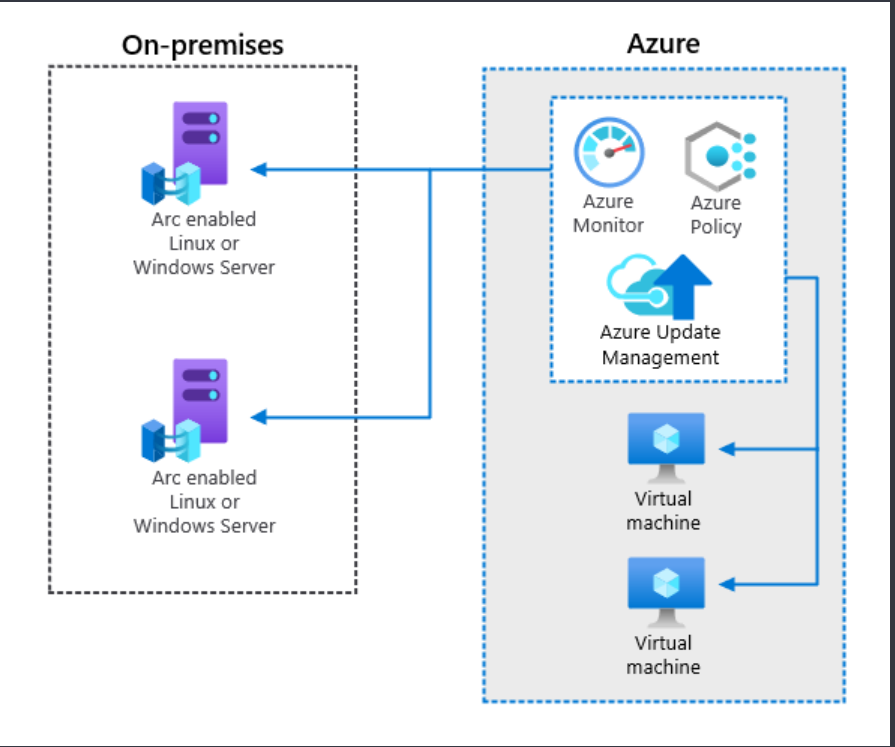
Resource types hosted outside of Azure

- Servers - both physical and virtual machines running Windows or Linux
- Kubernetes clusters - supporting multiple Kubernetes distributions
- Azure data services – SQL managed instances and PostgreSQL Hyperscale services
- SQL servers – SQL Server running on Windows or Linux
- Azure Stack HCI



Azure Arc-enabled servers

- Allows you to manage your Windows and Linux machines hosted outside of Azure
- A hybrid machine connected to Azure is treated as a resource in Azure



What does Azure Arc deliver?

- Implement consistent inventory, management, governance, and security for your servers across your environment.
- Configure Azure VM extensions to use Azure management services to monitor, secure, and update your servers.
- A unified experience viewing your Azure Arc-enabled servers whether you are using the Azure portal, Azure CLI, Azure PowerShell, or Azure REST API.

DEMO:
AZURE ARC-ENABLED SERVERS IN THE PORTAL

Connected Machine agent

- The Connected Machine agent (`azcmagent`) needs to be installed

- This agent does not deliver any other functionality
- It doesn't replace the Log Analytics agent / Azure Monitor Agent
- It sends a regular heartbeat message to the service every 5 minutes
- **Offline** status, when the heartbeat is not received
- **Connected** status, upon receiving a subsequent heartbeat

Prerequisites

- Supported operating systems
  - Windows Server 2008 R2 SP1, 2012 R2, 2016, 2019, and 2022 (including Server Core)
  - Ubuntu 16.04, 18.04, and 20.04 LTS
  - CentOS Linux 7 and 8
  - SUSE Linux Enterprise Server (SLES) 12 and 15
  - Red Hat Enterprise Linux (RHEL) 7 and 8
  - Amazon Linux 2
  - Oracle Linux 7
- Required permissions
  - To onboard machines:
    Azure Connected Machine Onboarding role
  - To read, modify, re-onboard, and delete a machine:
    Azure Connected Machine Resource Administrator role

Connected Machine agent

- Installation methods:
- Interactively: From the Azure portal using a generated script
- At scale: Using a service principal (and a script)
- At scale: Using PowerShell DSC (and a service principal)
- At scale: Using Azure Automation Update Management
- At scale: Az.ConnectedMachine PowerShell module
- Windows Admin Center: Azure Hybrid Services

DEMO:
CONNECTED MACHINE AGENT

Tagging Azure Arc-enabled servers

- One of the benefits of Arc-enabled servers is the ability to easily organize and manage server inventory applying tags

- It reduces administrative complexity and provides a consistent strategy for hybrid and multi-cloud environments

Exploring Arc-enabled servers with Resource Graph

- We can use Resource Graph to query Arc-enabled servers and get insight into our multi-cloud landscape

- Azure Resource Graph in the Azure portal
- “`Az.ResourceGraph`” PowerShell module
- “`resource-graph`” Azure CLI extension

- New resource types
- `"microsoft.hybridcompute/machines"`
- `"microsoft.hybridcompute/machines/extensions"`
- `"microsoft.hybridcompute/privatelinkscopes"`

DEMO:
TAGGING AND AZURE RESOURCE GRAPH

VM extension management

- Virtual machine (VM) extensions are small applications that provide post-deployment configuration and automation tasks on Azure VMs.

- Azure Arc-enabled servers enables you to deploy Azure VM extensions to **non-Azure** Windows and Linux VMs

- VM extensions can be managed using the following methods:
- The Azure portal
- Azure CLI
- Azure PowerShell
- Azure Resource Manager templates

Key benefits

- Download and execute scripts on hybrid connected machines using the Custom Script Extension.
- Collect log data for analysis with Logs in Azure Monitor enabled through the Log Analytics agent VM extension.
- Analyzes the performance of your Windows and Linux VMs, and monitor their processes and dependencies. Achieved through enabling both the Log Analytics agent and Dependency agent VM extensions.
- Automatically refresh of certificates stored in an Azure Key Vault.

Supported Azure VM extensions

The supported Azure VM extensions for your non-Azure machines:

- **Windows**
- WindowsAgent.AzureSecurityCenter
- IaaSAntimalware
- CustomScriptExtension
- MicrosoftMonitoringAgent
- DependencyAgentWindows
- KeyVaultForWindows
- AzureMonitorWindowsAgent
- HybridWorkerForWindows

- **Linux**
- LinuxAgent.AzureSecurityCenter

- CustomScript
- OmsAgentForLinux
- DependencyAgentLinux
- KeyVaultForLinux
- AzureMonitorLinuxAgent
- HybridWorkerForLinux

DEMO:
MANAGEMENT TASKS

Resources

- Azure Arc website
- https://azure.microsoft.com/services/azure-arc/

- Azure Arc Learning Path
- https://docs.microsoft.com/en-us/learn/paths/manage-hybrid-infrastructure-with-azure-arc/

- Azure Arc Jumpstart
- https://azurearcjumpstart.io/

Thank you.

Slides and demos from the conference will be available at

https://github.com/nordicinfrastructureconference/2022