



PowerShell Conference Europe

Unleashing the Power of Hybrid Management with PowerShell & Azure Arc

Jan Egil Ring

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PSCONF EU SPEAKER

```
PS /> Get-Speaker
```

Introduction



Azure Arc overview

Customer challenges when hybrid

Complexity

"I need to have health visibility in a single pane of glass to all my existing and future infrastructure and applications."

Compliance

"I need to manage security and incident management across my public cloud and datacenter assets."

Inconsistency

"I want my on-prem skills to work in the cloud, and my cloud skills to work on-prem."

Regulation

"Our DB layer must remain on-premises due to sensitive patient data and data availability needs."

Latency

"We can't take a dependency on the internet. If we lose connectivity, we still want to be able to access the data."

Legacy

"Our older systems take too much maintenance. We want evergreen technology and to pay for it like a utility."



Multi-cloud



Datacenter



Edge



Azure Arc

Azure Arc-enabled infrastructure
Connect and operate hybrid resources
as native Azure resources

Azure Arc-enabled services
Deploy and run Azure services outside of
Azure while still operating it from Azure




Multi-cloud


Datacenter


Edge

Arc-enabled Infrastructure

Consistent governance, security, and visibility for your hybrid and multi-cloud compute.



Microsoft
Defender



Azure
Monitor



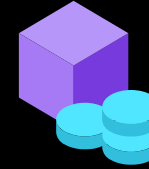
Microsoft
Sentinel



Azure
Policy



Update
Manager



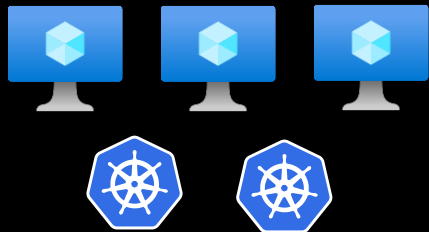
Inventory
Management



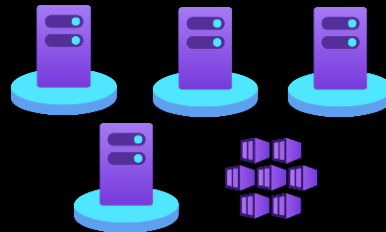
Azure
Automanage

← Azure Services across your infrastructure →

 Azure



 aws



On - premises



Arc Jumpstart

Extensive. Automated. Open-Source. Community Driven.



aka.ms/ArcJumpstart

Jumpstart
ArcBox



Fully automated Azure Arc sandbox

Arc Jumpstart – ArcBox ITPros architecture

Deployed via ARM Template or Bicep



ArcBox resource group

ArcBox Workbook

Azure Monitor



Azure Policy



Azure Log Analytics



Microsoft Defender
for Cloud (Servers and SQL)



Microsoft Sentinel



Azure Update Manager



Migration assessment



Best practices
assessment



ArcBox-SQL
Arc-enabled server and SQL server



ArcBox-Win2K22
Arc-enabled server



ArcBox-Win2K25
Arc-enabled server



ArcBox-Ubuntu-01
Arc-enabled server



ArcBox-Ubuntu-02
Arc-enabled server



ArcBox-SQL
Nested Hyper-V VM



ArcBox-Win2K22
Nested Hyper-V VM



ArcBox-Win2K25
Nested Hyper-V VM



ArcBox-Ubuntu-01
Nested Hyper-V VM



ArcBox-Ubuntu-02
Nested Hyper-V VM



ArcBox-Client

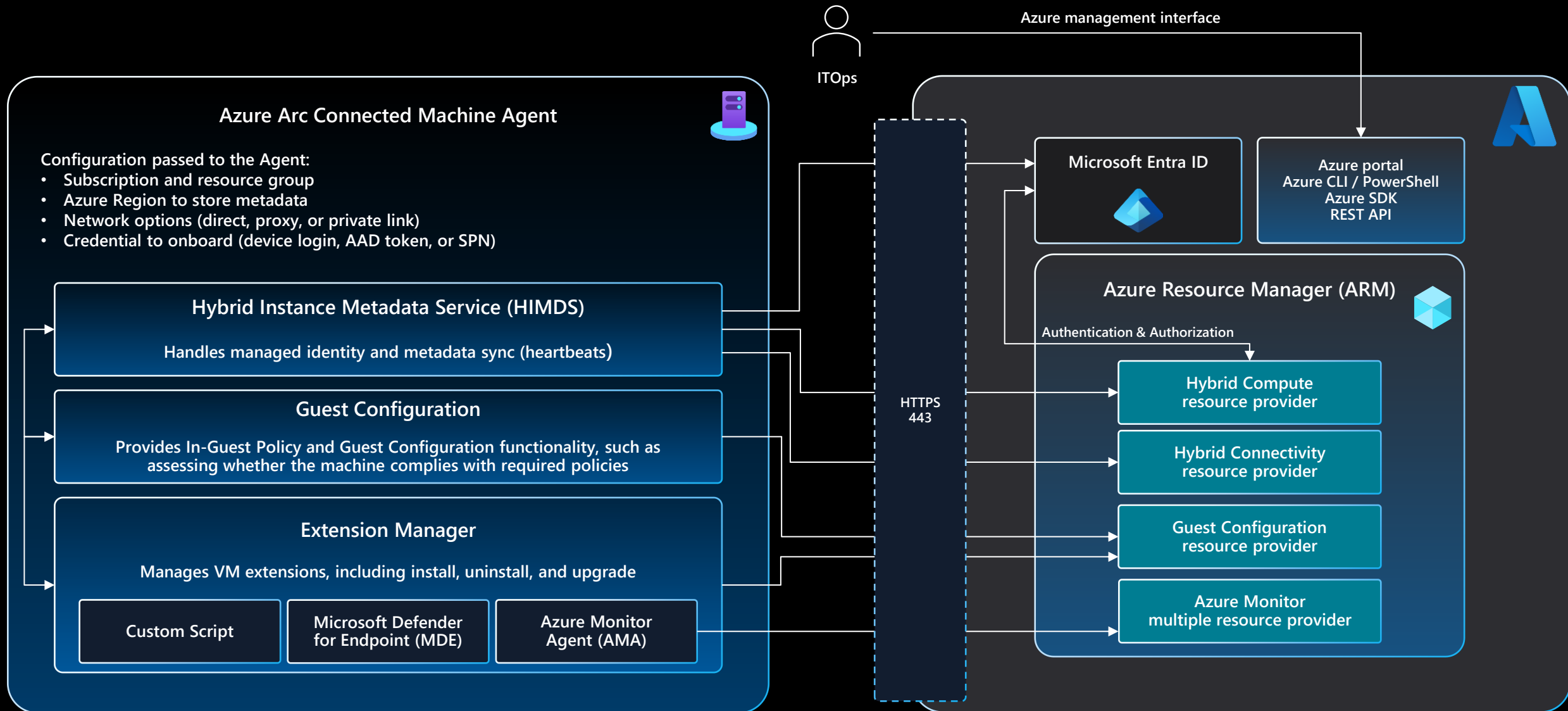


Windows Server 2025 Client VM (deployed in Azure, nested virtualization enabled)



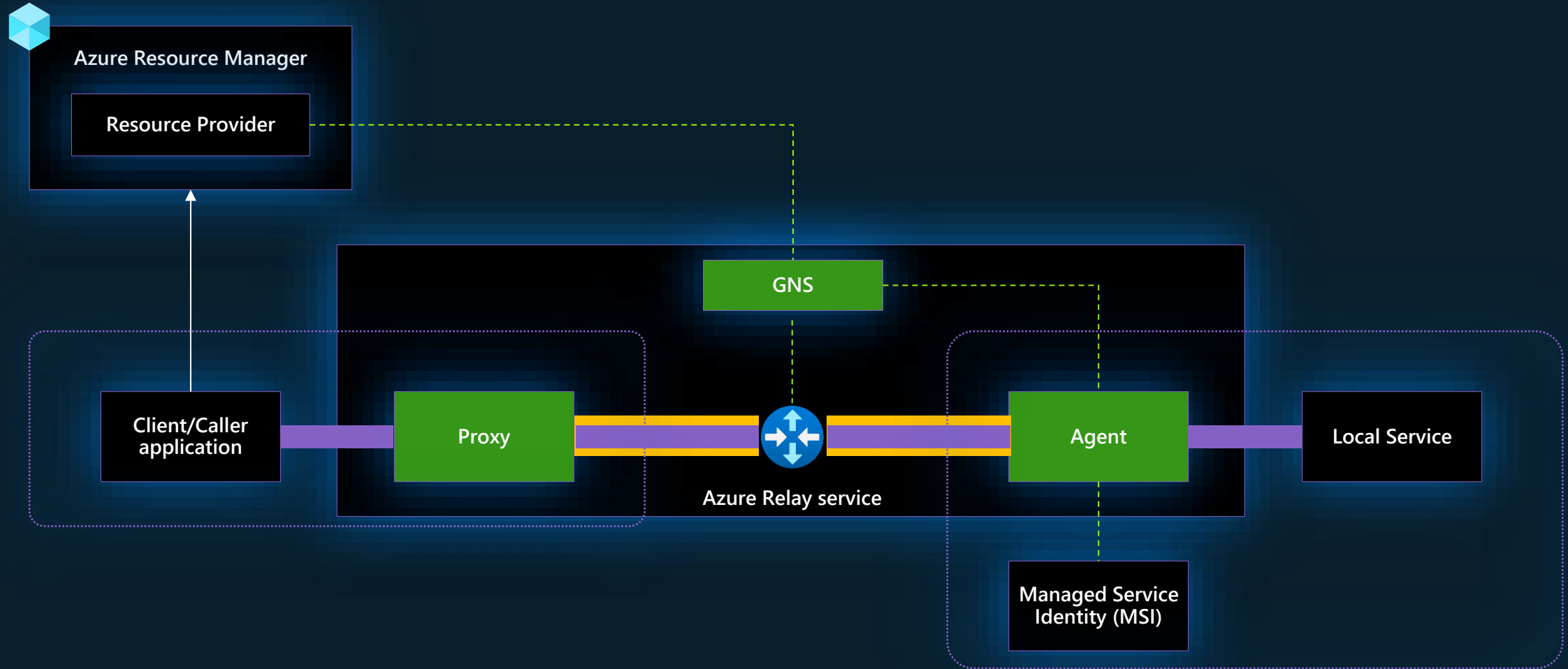
ArcBox Azure Virtual Network

Arc-enabled servers – Connected Machine agent architecture



Azure Arc-enabled servers

SSH access - Architecture



Demos

We love Demos!





- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Settings
 - Connect
 - Security
 - Extensions
 - Properties
 - Locks
- Operations
- Licenses
- Windows management
 - Windows Admin Center (preview)
 - Azure Site Recovery configuration (preview)

Connect with SSH

Enter your authentication details below to connect to the server via SSH. [Learn more](#)

Authentication type

- ☐ Microsoft Entra
- ☒ SSH key based authentication
- ☐ Password

Username *

SSH private key location

- ☐ Azure Key Vault
- ☒ Insert manually

SSH private key *

Azure doesn't store the SSH private key.

☐ Use a SSH certificate key

Connect in browser

Alternatively, run the following command using any SSH client of your choice that has Azure CLI or PowerShell.

```
az ssh arc --subscription "5d743864-3e9e-4dc1-b446-1982647eeaf8" --resource-group "Student02" --name "ArcBox-Win2K25" --local-user $username --private-key-file $privateKeyFile
```

Hybrid runbook workers

Automate maintenance tasks

- Remediate low disk space
- Restart services/servers
- Orchestration across machines

Automate business workflows

- Joiners/movers/leavers

Automate tasks in service catalog

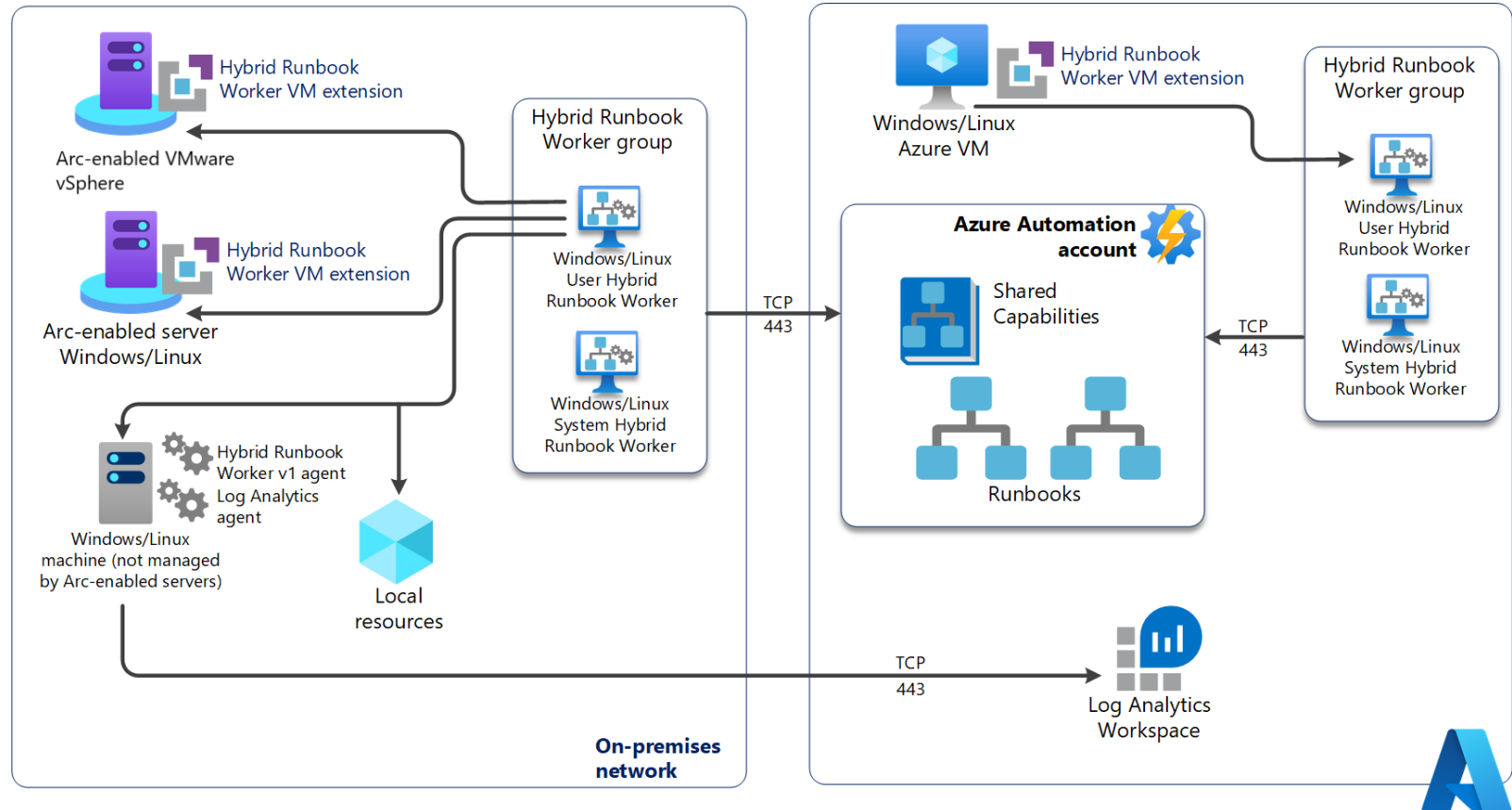
- Provision on-prem virtual machines

Respond to Azure Monitor alerts

- Automatic remediation

Integration scenarios

- Event Grid – trigger on SFTP BlobCreated



Run automation runbooks on your Azure Arc-enabled servers

How to prepare your Arc-enabled servers:

- ✔ Install Hybrid Worker extension
- ✔ Add to Hybrid Worker Group
- ✔ Ready to execute runbooks

twt-automation | Hybrid worker groups

Automation Account

Search

×

«

+

Create hybrid worker group

Feedback

Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Process Automation

Runbooks

+

Use hybrid worker groups

System hybrid worker groups

ⓘ

Azure Automation Agent-based User Hybrid Runbook Worker (Windows and Linux) will retire on 31 August 2024 and would not be supported after that date. You need to complete migration of existing Agent-based User Hybrid Workers to Extension-based Hybrid Workers before 31 August 2024.
[Learn more](#)

Users can create and maintain [hybrid worker groups](#) for running hybrid jobs, which provides resiliency to run jobs across multiple hybrid workers. With extension-based hybrid worker, both Azure machines and non-Azure machines (through Arc-enabled server and Arc-enabled VMware VM (preview)) can be managed through ARM templates and policies. [Learn more](#)

windows (twt-automation/windows) | Hybrid Workers

Hybrid Worker Group

Search

×

«

+

Add

Delete

Feedback

Refresh

Overview

Hybrid worker group

Hybrid Workers

Settings

Automation

CLI / PS

⚠

Azure Automation Agent-based User Hybrid Runbook Worker (Windows and Linux) will retire on 31 August 2024 and would not be supported after that date. You need to complete migration of existing Agent-based User Hybrid Workers to Extension-based Hybrid Workers before 31 August 2024. [Learn more](#)

ⓘ

Azure Automation offers onboarding hybrid runbook worker using extensions for Azure machines and non-Azure machines (through Arc-enabled Server and Arc-enabled VMware vSphere (preview)). Hybrid Worker extension supports [Automatic upgrade](#) of minor versions by default. You can disable automatic upgrades anytime. [Learn more](#)

twt-app-01 | Extensions

Machine - Azure Arc

Search

×

«

+

Add

Refresh

Update

Enable automatic upgrade

Disable automatic upgrade

Uninstall

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Connect

Security

Extensions

Properties

Locks

🔗

What extensions can I use to secure my machine?

What extensions can I enable on this machine?

ⓘ

The Log Analytics agents (OMS/MMA) will reach end of support by August 2024. Azure Monitor agent is the recommended replacement. [Learn more about migrating to Azure Monitor](#)

Search to filter items...

Name	Type	Version	Update available	Status	Automatic upgrade
<input type="checkbox"/> DependencyAgentWindows	DependencyAgentWindows	9.10.18.4770	No	Succeeded	Enabled
<input type="checkbox"/> AzureMonitorWindowsAgent	AzureMonitorWindowsAgent	1.30.0.0	No	Succeeded	Enabled
<input type="checkbox"/> MDE.Windows	MDE.Windows	1.0.11.2	No	Succeeded	Not supported
<input type="checkbox"/> WindowsPatchExtension	WindowsPatchExtension	1.5.71	No	Succeeded	Enabled
<input type="checkbox"/> HybridWorkerExtension	HybridWorkerForWindows	1.1.13	No	Succeeded	Enabled

Machine Configuration

Audit and configure OS, app, or workload level settings as code



Dynamically assign configurations to Windows & Linux machines running in Azure and anywhere else via Arc-enabled Servers



Continuous auditing and enforcement of configuration settings with at scale and granular reporting



Deploy built-in content provided by Microsoft including security best practices within the Azure Security Benchmark



Bring your own best practice configurations into Azure through custom artifact deployment and PowerShell DSC

Management



Deploy data-plane level policies at-scale through Azure policy leveraging familiar scoping

Develop configuration as code pipelines leveraging ARM, Bicep, Terraform

The DSC Community

A collaborative community of authors and maintainers working to improve the DSC resources, their quality, and development practices



Community

The Community behind the DSC Resource Kit



Resource Modules

List of the resource modules from the Resource Kit or from the same family



Guidelines

The guidelines for the DSC Community around contributing, maintaining, and style



Blog Posts

Blog from the maintainers, Contributors and guests



Configuration Management

DSC, Guest Configuration and solutions



Community Calls

Agenda for the next community call and meeting notes

<https://dsccommunity.org>



Open Source: ntools - making managing Linux easier for PowerShell users

A collection of class-based DSC Resources for commonly used Linux actions & built-in machine configuration packages

Built in Resources



User and Group Management

- Create & delete local users
- Create & delete local groups
- Set properties of existing groups



File System Operations

- Set, remove, or replace file content
- Adjust file ownership
- Compare file permissions
- Set file permissions



Package Management

- List
- Search
- Install
- Uninstall



Service Management

- Start
- Stop
- Restart
- Remove
- Add



Archive Operations

- Compress archives
- Extract archives

Full Distro Support

PUBLISHER	NAME	VERSIONS
Amazon	Linux	2
CloudLinux	Alma Linux	9
Canonical	Ubuntu Server	14.04 - 22.x
Credativ	Debian	8 - 10.x
Mariner	Mariner	1-2
Microsoft	Windows Server	2012 - 2025
Microsoft	Windows Client	Windows 10/11
Oracle	Oracle-Linux	7.x - 8.x
OpenLogic	CentOS	7.3 - 8.x
Red Hat	Red Hat Enterprise Linux*	7.4 - 9.x
Rocky Enterprise	Rocky Linux	9
SUSE	SLES	12 SP3-SP5, 15.x

<https://github.com/azure/ntools>

How to create and assign a custom Automanage Machine Configuration to your Arc-enabled servers

- ✓ Create PowerShell Desired State Configuration (DSC) configuration
- ✓ Create package artifact
- ✓ Create Azure Policy definition
- ✓ Create Azure Policy assignment

twt-app-01 | Machine Configuration ☆ ...

Machine - Azure Arc

Search

+ Create Refresh Delete

Access control (IAM)
Tags
Diagnose and solve problems
Settings
Connect
Security
Extensions
Properties
Locks
Operations
Policies
Machine Configuration

This is a list of configurations assigned to your server. Configurations can be assigned in three ways: through Azure Policy, manually, or system-assigned. Manual assignments represent custom configurations assigned to this server. Through manual configurations you can edit the version, configuration type and custom URI. [Learn more](#)

Filter for any field... Status == All Type == All Source == All

Showing 1 to 5 of 5 records.

Configuration name	Version	Status	Rules	Type	Source
<input type="checkbox"/> AuditSecureProtocol (twt-app-01/AuditSecureProtocol)	1.*	Non-compliant	0% (0 out of 1)	Audit	Manual assignment
<input type="checkbox"/> AzureWindowsBaseline (twt-app-01/AzureWindowsBaseline)	1.*	Non-compliant	68% (196 out of 288)	Audit	Manual assignment
<input type="checkbox"/> PasswordMustMeetComplexityRequirements (twt-app-01/P...	1.*	Compliant	100% (1 out of 1)	Audit	Azure Policy
<input type="checkbox"/> TailwindTraders_Windows\$pid2ljhv5xeuiym (twt-app-01/Ta...	1.0.0	Compliant	100% (3 out of 3)	Audit	Manual assignment
<input type="checkbox"/> WindowsDefenderExploitGuard (twt-app-01/WindowsDefe...	1.*	Non-compliant	0% (0 out of 1)	Audit	Manual assignment

Next steps

Explore hybrid scenarios at aka.ms/ArcJumpstart



Related sessions:

- Migrating to PowerShell 7 for IT pros – Tuesday @ 13:00
- SSH and SSH Arc: What's new and next – Thursday @ 13.00
- Secure your cloud environment with all-new Azure Policy and Machine Configuration features! Thursday @ 13.00

Q&A

15 minutes

