

Windows Image Creation Using Packer on Microsoft Azure

PROJECT OVERVIEW

Project Title: Windows Image Creation Using Packer on Microsoft Azure

Aim: The aim of this project is to design and build a reusable custom Windows virtual machine image in Microsoft Azure using HashiCorp Packer. This automated image creation improves consistency, scalability, and deployment speed.

Project Implementation Steps:

- Create an Azure Resource Group for image storage.
 - gowtham-windows-image-creation-rg

The screenshot shows the 'Create a resource group' page in the Microsoft Azure portal. The 'Basics' tab is selected. The 'Subscription' dropdown is set to 'Azure subscription 1'. The 'Resource group name' input field contains 'gowtham-windows-image-creation-rg'. The 'Region' dropdown is set to '(Europe) North Europe'. The page includes a brief description of what a resource group is and links to learn more.

- Create an Azure Active Directory Service Principal.
 - windows-image-creation

The screenshot shows the 'windows-image-creation' app registration page in the Microsoft Azure portal. The 'Overview' tab is selected. The 'Essentials' section displays the following details:

- Display name: windows-image-creation
- Application (client) ID: [REDACTED]
- Object ID: [REDACTED]
- Directory (tenant) ID: [REDACTED]
- Supported account types: My organization only
- Client credentials: Add a certificate or secret
- Redirect URLs: Add a Redirect URI
- Application ID URI: Add an Application ID URI
- Managed application in ...: windows-image-creation

There are also two informational messages at the bottom: one about the new App registrations experience and another about the deprecation of ADAL starting June 30th, 2020. A success message indicates the application was successfully created.

- Create new client secrets
 - new-client-secret

Windows Image Creation Using Packer on Microsoft Azure

The screenshot shows the Microsoft Azure portal's 'Certificates & secrets' blade for an app registration. The registration name is 'windows-image-creation'. Under the 'Client secrets' tab, there is one entry named 'new-client-secret' with a value and an expiration date of 27/07/2026. A success message at the top right says 'Successfully updated application windows-image-creation credentials'.

- Add role assignment

The screenshot shows the Microsoft Azure portal's 'Access control (IAM)' blade for an Azure subscription. Under the 'Role assignments' tab, it shows two role assignments. One is labeled 'Privileged' with a value of 2. An action required notice states: 'Action required: As of August 31, 2024, Azure classic administrator roles (along with Azure classic resources, Azure Service Manager) are retired and are no longer supported. If you still have active Co-Administrator or Service Administrator role assignments, convert these roles to Azure RBAC immediately.' A link to learn more is provided.

The screenshot shows the Microsoft Azure portal's 'Add role assignment' dialog. Under the 'Members' tab, 'windows-image-creation' is selected from a list of applications. Other options include Windows Azure Active Directory Application, Windows Azure Security Resource Provider Application, Windows Cloud Login Application, and WindowsDefenderATP Application. The 'Selected members' section shows 'windows-image-creation Application'.

- Install and configure Packer on the local system.

S	Name	Date modified	Type	Size
	packer	09-09-2025 11:31	Application	42,199 KB
	packer	21-01-2026 15:29	JSON Source File	2 KB

Windows Image Creation Using Packer on Microsoft Azure

- Define an Azure ARM Packer template.

```
① packer.json M X
② packer.json > ...
1  [
2    "builders": [
3      {
4        "type": "azure-arm",
5        "client_id": "*****",
6        "client_secret": "*****",
7        "tenant_id": "*****",
8        "subscription_id": "*****",
9
10       "managed_image_resource_group_name": "gowtham-windows-image-creation-rg",
11       "managed_image_name": "myPackerwindowsImage",
12
13       "os_type": "Windows",
14       "image_publisher": "MicrosoftWindowsServer",
15       "image_offer": "WindowsServer",
16       "image_sku": "2016-Datacenter",
17
18       "communicator": "winrm",
19       "winrm_use_ssl": true,
20       "winrm_insecure": true,
21       "winrm_timeout": "5m",
22       "winrm_username": "packer",
23
24       "azure_tags": {
25         "dept": "Engineering",
26         "task": "Image deployment"
27       },
28
29       "build_resource_group_name": "gowtham-windows-image-creation-rg",
30       "vm_size": "Standard_E2s_v3"
31     },
32     "provisioners": [
33       {
34         "type": "powershell",
35         "inline": [
36           "Add-WindowsFeature Web-Server",
37           "while ((Get-Service RdAgent).Status -ne 'Running') { Start-Sleep -s 5 }",
38           "while ((Get-Service WindowsAzureGuestAgent).Status -ne 'Running') { Start-Sleep -s 5 }",
39           "& $env:SystemRoot\\System32\\Sysprep\\Sysprep.exe /oobe /generalize /quiet /quit",
40           "while($true) { $imageState = Get-ItemProperty HKLM:\\SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Setup\\State | Select Im
41         ]
32     }
42   ]
]
```

- **Image Configuration**

OS Type: Windows

Publisher: MicrosoftWindowsServer

Offer: WindowsServer

SKU: 2016-Datacenter

VM Size: Standard_E2s_v3

Build Resource Group: gowtham-windows-image-creation-rg

- **Provision the VM by Installing Required Roles (IIS)**

Internet Information Services (IIS)

Required web server components

- Deprovision the VM and capture it as a managed image.

Packer Configuration Details:

- Builder Type: azure-arm
- Operating System: Windows-2016-Datacenter
- Region: North Europe

Windows Image Creation Using Packer on Microsoft Azure

- VM Size: Standard_E2s_v3
- Provisioner: Shell
- Managed Image Output: Azure Managed Image

Execution Process:

- Run the Packer build command from PowerShell or terminal.
- Packer creates a temporary VM in Azure.
- IIS is installed automatically during provisioning.
- The VM is deprovisioned.
- The final image is saved as an Azure managed image.

```
PS C:\Users\gowth\OneDrive\Desktop\repo\windows-image-creation-using-packer> dir

Directory: C:\Users\gowth\OneDrive\Desktop\repo\windows-image-creation-using-packer

Mode                LastWriteTime         Length Name
----                <-----           <----- Name
-a---l       09-09-2025     11:31        43211656 packer.exe
-a---l       28-01-2026     19:22         1627 packer.json

PS C:\Users\gowth\OneDrive\Desktop\repo\windows-image-creation-using-packer> packer.exe build packer.json
azure-arm: output will be in this color.

==> azure-arm: Running builder ...
==> azure-arm: Creating Azure Resource Manager (ARM) client ...
==> azure-arm: ARM Client successfully created
==> azure-arm: Getting source image id for the deployment ...
==> azure-arm:   -> SourceImageName: '/subscriptions/...'; /Microsoft.Compute/locations/northeurope/publishers/MicrosoftWindowsServer/ArtifactTypes/vmimage/offers/WindowsServer/skus/2016-Datacenter/versions/latest'
==> azure-arm: Using existing resource group ...
==> azure-arm:   -> ResourceGroupName : 'gowtham-windows-image-creation-rg'
==> azure-arm:   -> Location          : 'northeurope'
==> azure-arm: Validating deployment template ...
==> azure-arm:   -> ResourceGroupName : 'gowtham-windows-image-creation-rg'
==> azure-arm:   -> DeploymentName   : 'kvpkrdpnij0ebpo0z'
==> azure-arm: Deploying deployment template ...
==> azure-arm:   -> ResourceGroupName : 'gowtham-windows-image-creation-rg'
```

- The custom Windows image **mypackerwindowsimage** was successfully created and is now available for deploying new virtual machines

The screenshot shows the Microsoft Azure Compute Infrastructure Custom Images page. On the left, there's a navigation sidebar with options like Overview, All resources, Infrastructure (Virtual machines, Virtual Machine Scale Set (VMSS), Compute Fleet), Disks + images (Custom images, Disks, Snapshots, Disk encryption sets), Capacity + placement, Related services, and Monitoring + Policy. The main area has tabs for Overview, Manage view, Refresh, Export to CSV, Open query, Assign tags, Add to service group, and Group by none. It also includes filters for Subscription equals all, Resource Group equals all, Location equals all, and Add filter. Below these are search and sort fields for Name, Source virtual machine, OS type, Resource Group, and Location. A table lists the custom image 'mypackerwindowsimage'. The table columns are Name (mypackerwindowsimage), Source virtual machine (pkrvmnij0ebpo0z), OS type (Windows), Resource Group (gowtham-windows-image-creation-rg), and Location (North Europe). There are also three dots and edit icons for each row.

Windows Image Creation Using Packer on Microsoft Azure

Security Considerations:

Service principal credentials must be kept secure. If a secret is exposed, it should be rotated immediately. Using Managed Identity is recommended to avoid storing secrets in configuration files.

Conclusion:

This project successfully demonstrates automated Windows image creation in Azure using Packer. The generated custom image with IIS pre-installed ensures consistency, reduces manual configuration effort, and accelerates virtual machine deployments in the cloud.