Reduce image pull time with Artifact Streaming on Azure Kubernetes Service (AKS) (Preview)

Artifact Streaming on AKS, particularly for high-performance compute tasks.

Understanding the problem:

When dealing with large container images. And these images are pulled from a container registry, such as Azure Container Registry , it can take a long time to download the entire image before a pod can start. This can slow down your deployment and impact on applications, especially when working with very large images.

What is Artifact Streaming on AKS?

**\*\***Artifact Streaming is a feature in Azure Kubernetes Service (AKS) that minimizes the time of pulling images by allowing them to be streamed directly from Azure Container Registry (ACR) to AKS. Instead of pulling the entire image all at once**\*\*.**

* AKS only pulls the necessary layers required for the initial startup the POD.
* This Primarily reduces the time to pull an Image and initiate the pod within short time.

# Key Benefits:

1. Faster Pod Startup (<10GB):

* Now for image’s under 10GB, might take minutes to pull. But using Artifact Streaming can now happen in seconds.

1. Above (>30GB):

* This feature is Useful for only under 30GB. For images larger than it’s better to Mount the files as a volume rather than including it as a layer in the image.

1. Concurrent Pod Startup:

* Normally without Artifact Streaming. Pods would start in a serial (One by one) method, waiting for the complete image to be pulled. With Artifact Streaming, Pods can start concurrently (at the same time) because they only require the minimal necessary image layers initially.

***Q1) When to Use Artifact Streaming?***

Ideal Use case is less than 30GB Size of an Image.

Not Ideal Use case is Greater than 30GB Size of an Image.

**Q2) How to Enable Artifact Streaming?**

To enable this feature, you would need to enable Artifact Streaming on your AKS node pools.

**Q3) How AKS and ACR Authentication will happen?**

1. Using Service Principal, this will be granted the ‘AcrPull’ role on the ACR.

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| # Create a service principal  **az ad sp create-for-rbac --name <service-principal-name> --role Contributor --scopes /subscriptions/<subscription-id>**  # Assign AcrPull role to the service principal  **az role assignment create --assignee <service-principal-id> \**  **--role AcrPull \**  **--scope /subscriptions/<subscription-id>/resourceGroups/<resource-group>/providers/Microsoft.ContainerRegistry/registries/<acr-name>** |

Considerations:

* Requires management of service principal credentials (client ID and secret).
* Rotate credentials periodically for security**.**

1. Azure Active Directory (AAD) Integration with Managed Identity.

Enable Artifact Streaming on ACR

Enablement on ACR is a prerequisite for Artifact Streaming on AKS.

* Create an ACR With Premium SKU.

Create a Artifact Streaming from the image using the ‘**az acr artifact-streaming create’** command.

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| **az acr artifact-streaming create –image <image\_name>** |

Verify the Artifact Streaming creation using the ‘**az acr manifest list-referrers’** command.

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| **az acr manifest list-referrers --name <image\_name>** |

Enable Artifact Streaming on AKS

* + Enable Artifact Streaming on a new node pool
    - Create a new node pool with Artifact Streaming enabled using the commands with –-enable-artifact-streaming.

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| Azure CLI Copy Open Cloud Shell  az aks nodepool add \  --resource-group myResourceGroup \  --cluster-name myAKSCluster \  --name myNodePool \  --enable-artifact-streaming |

* + Enable Artifact Streaming on a new node pool
* Update an existing node pool to enable Artifact Streaming using command with –-enable-artifact-streaming.

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| Azure CLI Copy Open Cloud Shell  az aks nodepool update \  --resource-group myResourceGroup \  --cluster-name myAKSCluster \  --name myNodePool \  --enable-artifact-streaming |

Check if Artifact Streaming is enabled

Now You enabled Artifact Streaming on a premium ACR and connected that to an AKS node pool. any new pod deployments on this cluster with an image pull from the ACR with Artifact Streaming enabled will see reductions in image pull times.

* Check if your node pool has Artifact Streaming enabled using the **az aks nodepool show** command.

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| Azure CLI Copy Open Cloud Shell  az aks nodepool show --resource-group myResourceGroup --cluster-name myAKSCluster --name myNodePool --query artifactStreamingProfile |