4. Remove the ACI container after verifying secure access.

Practical Task 5: Deploy a Kubernetes Cluster with AKS via Azure Portal

Requirements:

1. Create an Azure Kubernetes Service (AKS) cluster with the smallest VM size (e.g., B2s) and the minimum number of nodes (e.g., 1–2).
2. Connect to the AKS cluster using Azure Cloud Shell with kubectl.
3. Deploy a lightweight Nginx application for verification.
4. Delete the AKS cluster immediately after testing to avoid additional VM and cluster costs.

Practical Task 6: Deploy a Containerized Application on AKS

Requirements:

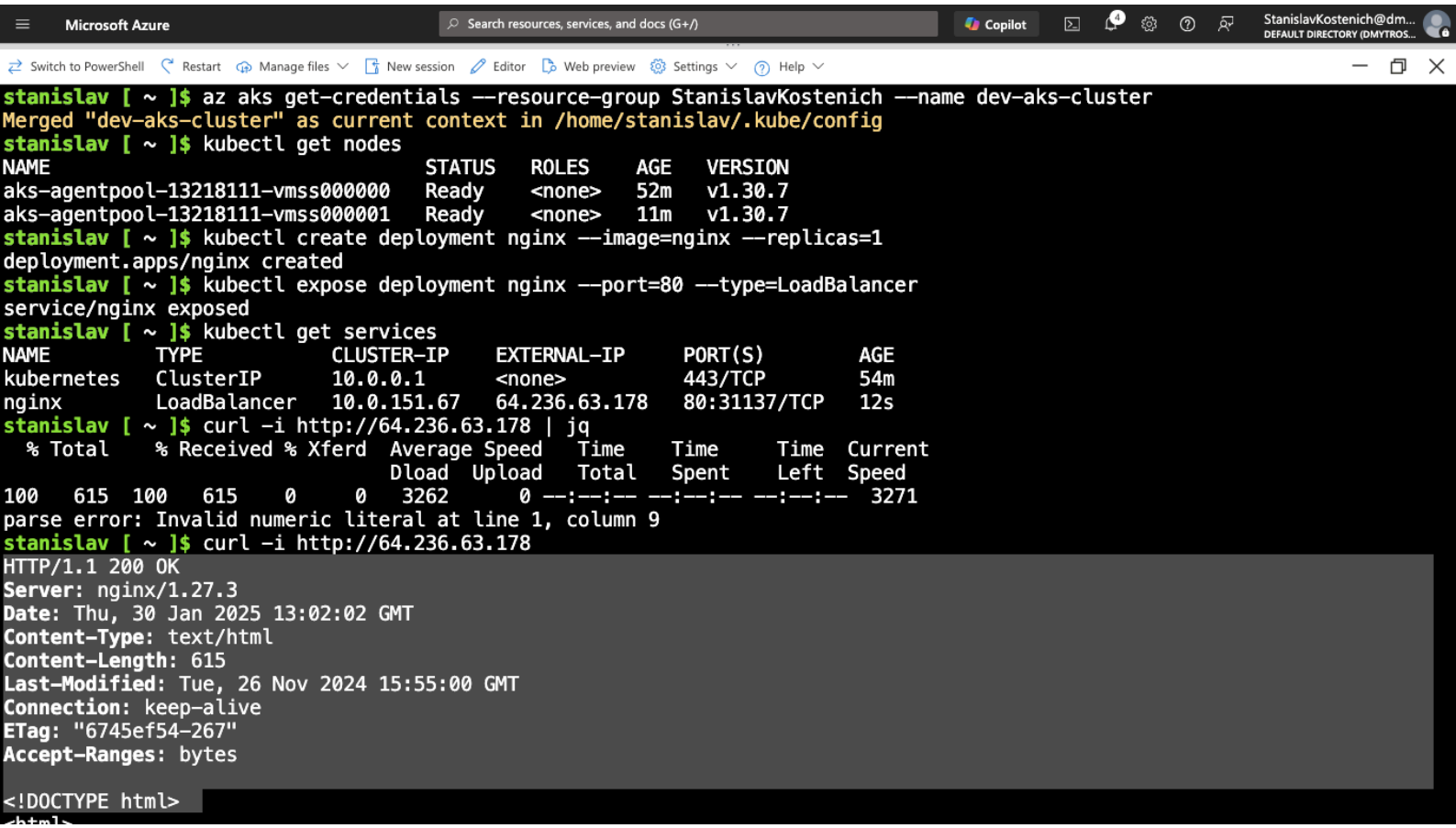
1. Build a lightweight Docker image for a simple web application (e.g., a Node.js app with minimal dependencies) and push it to Azure Container Registry (ACR).
2. Reuse the AKS cluster from Task 5 to deploy the application using a Kubernetes deployment

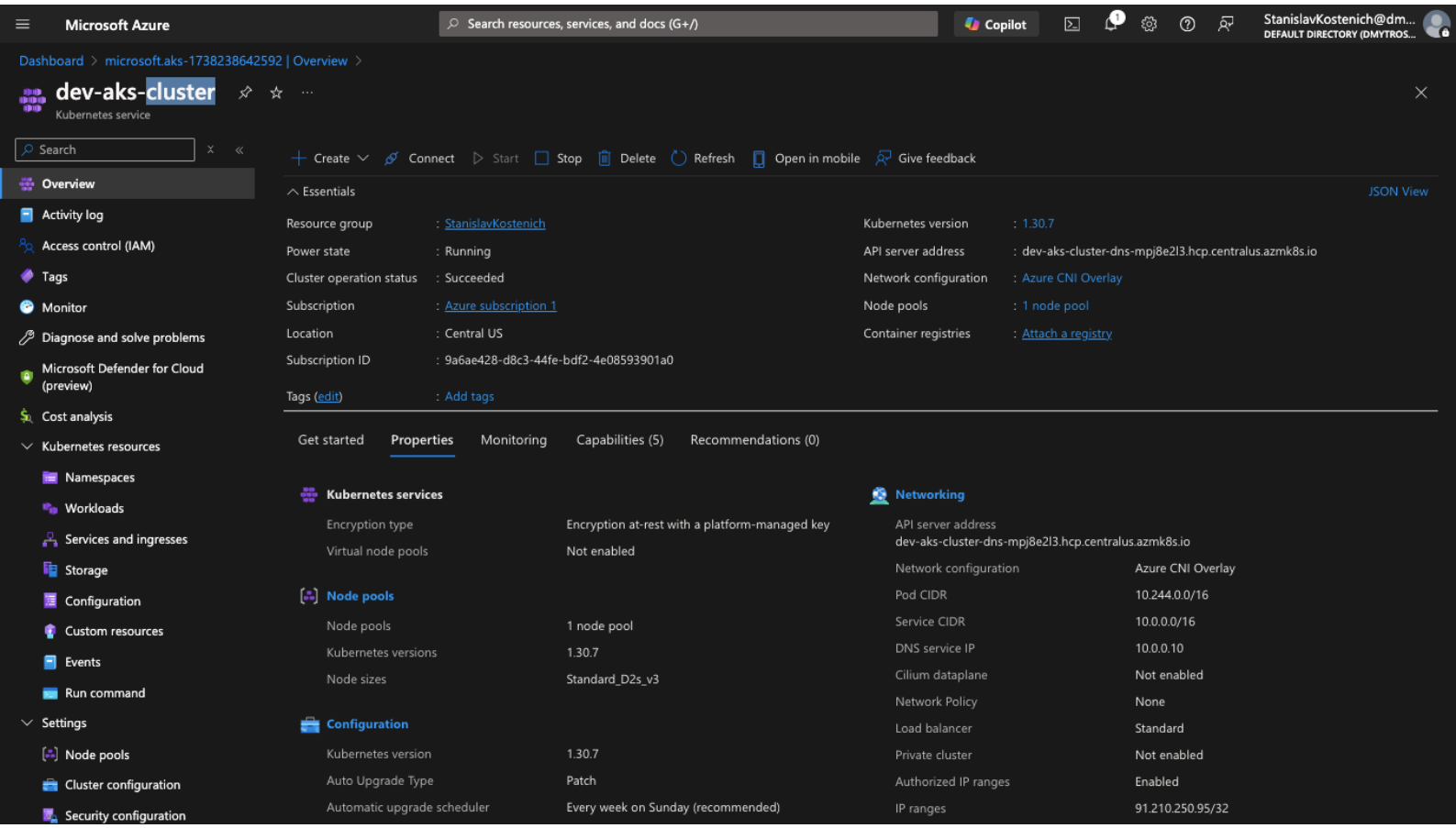
Welcome to nginx!

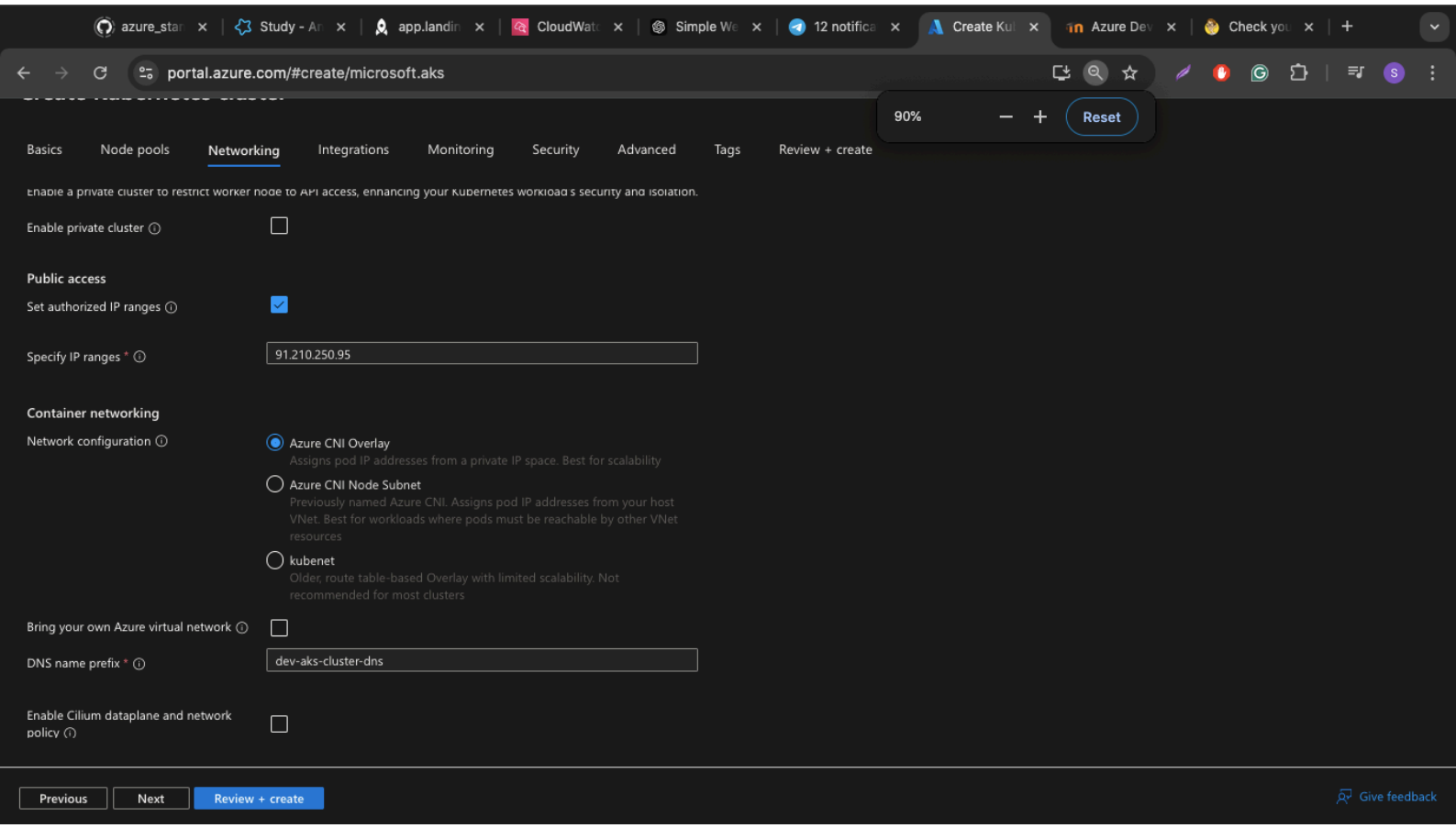
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

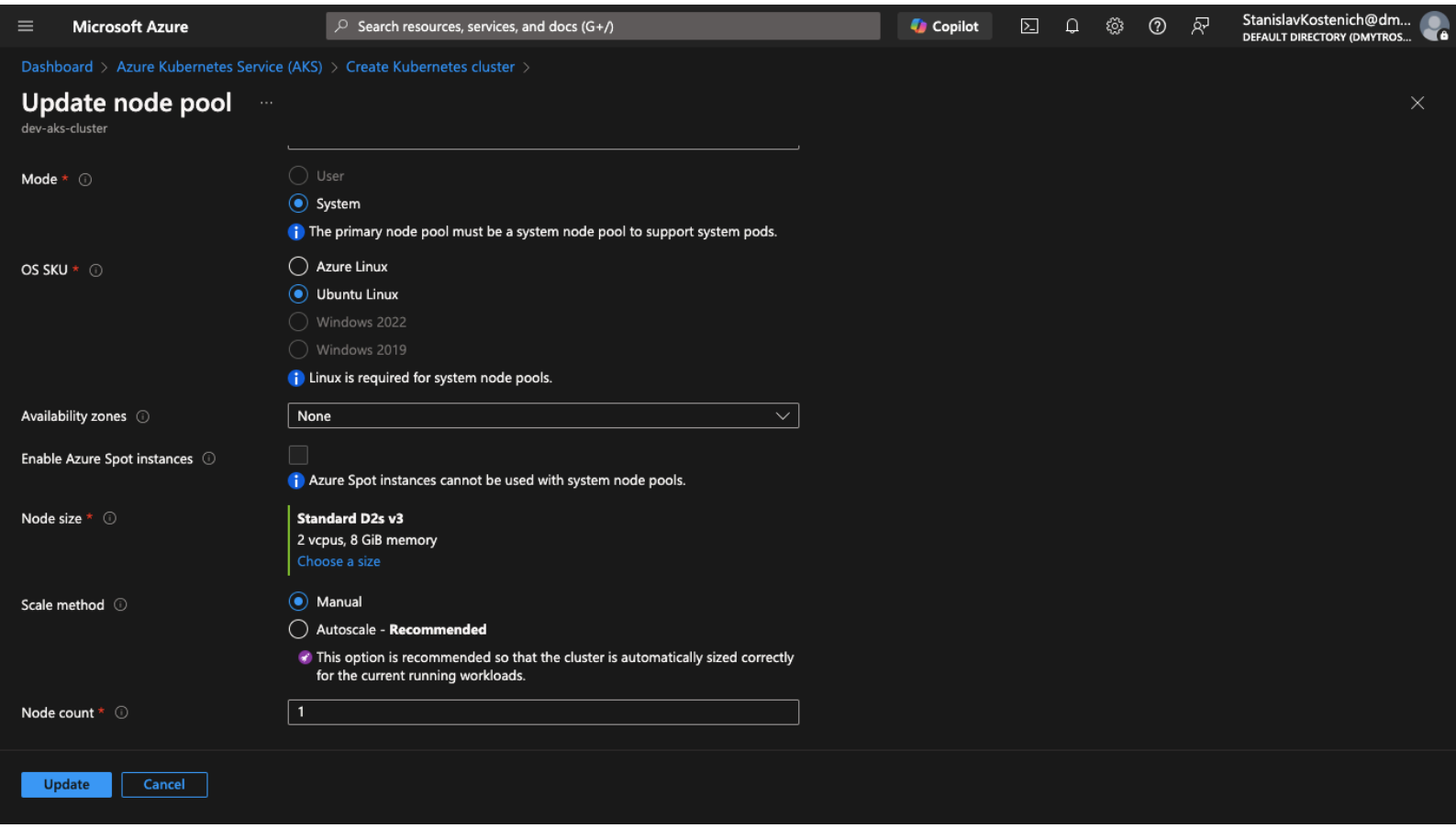
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

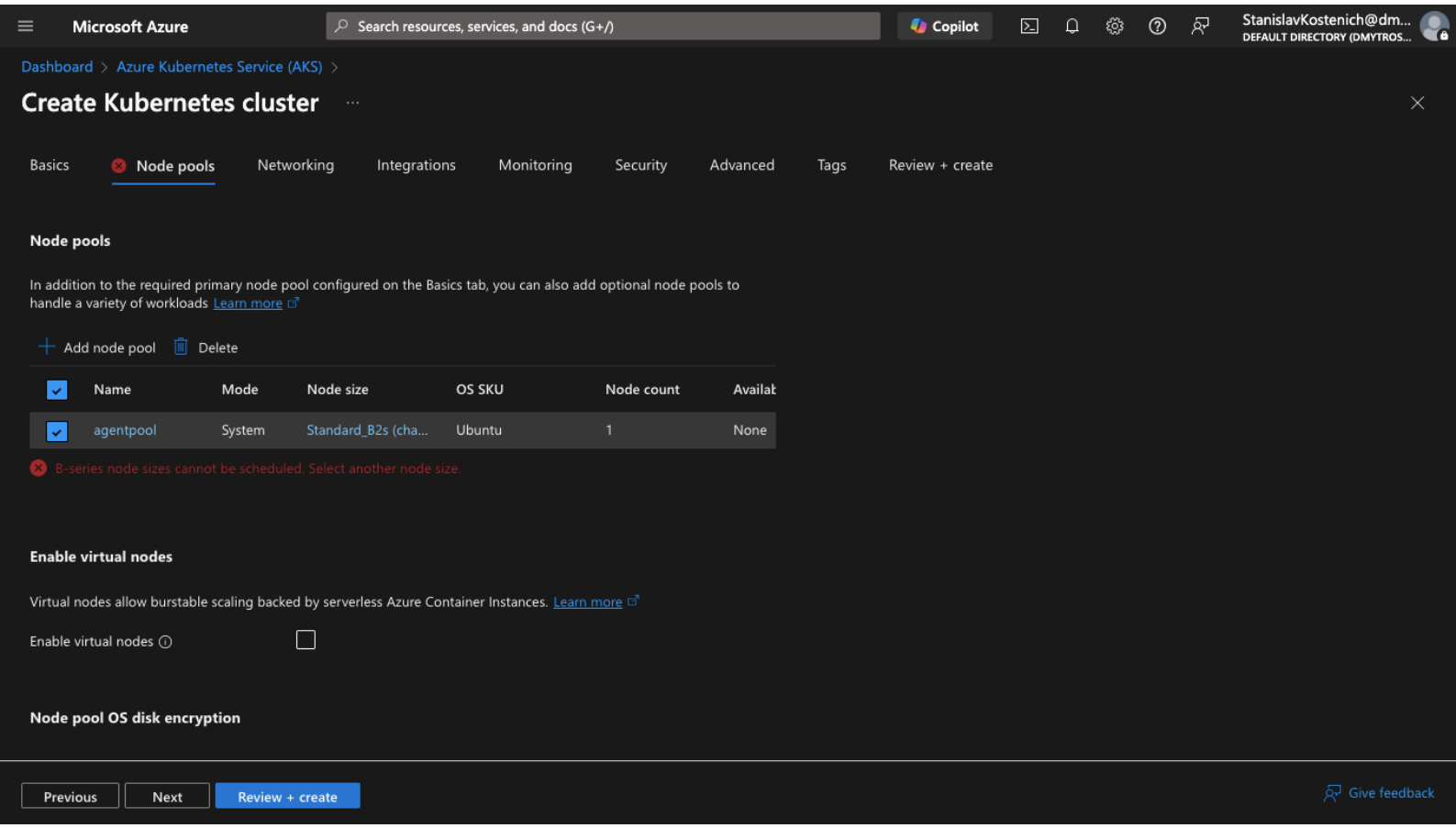
Thank you for using nginx.

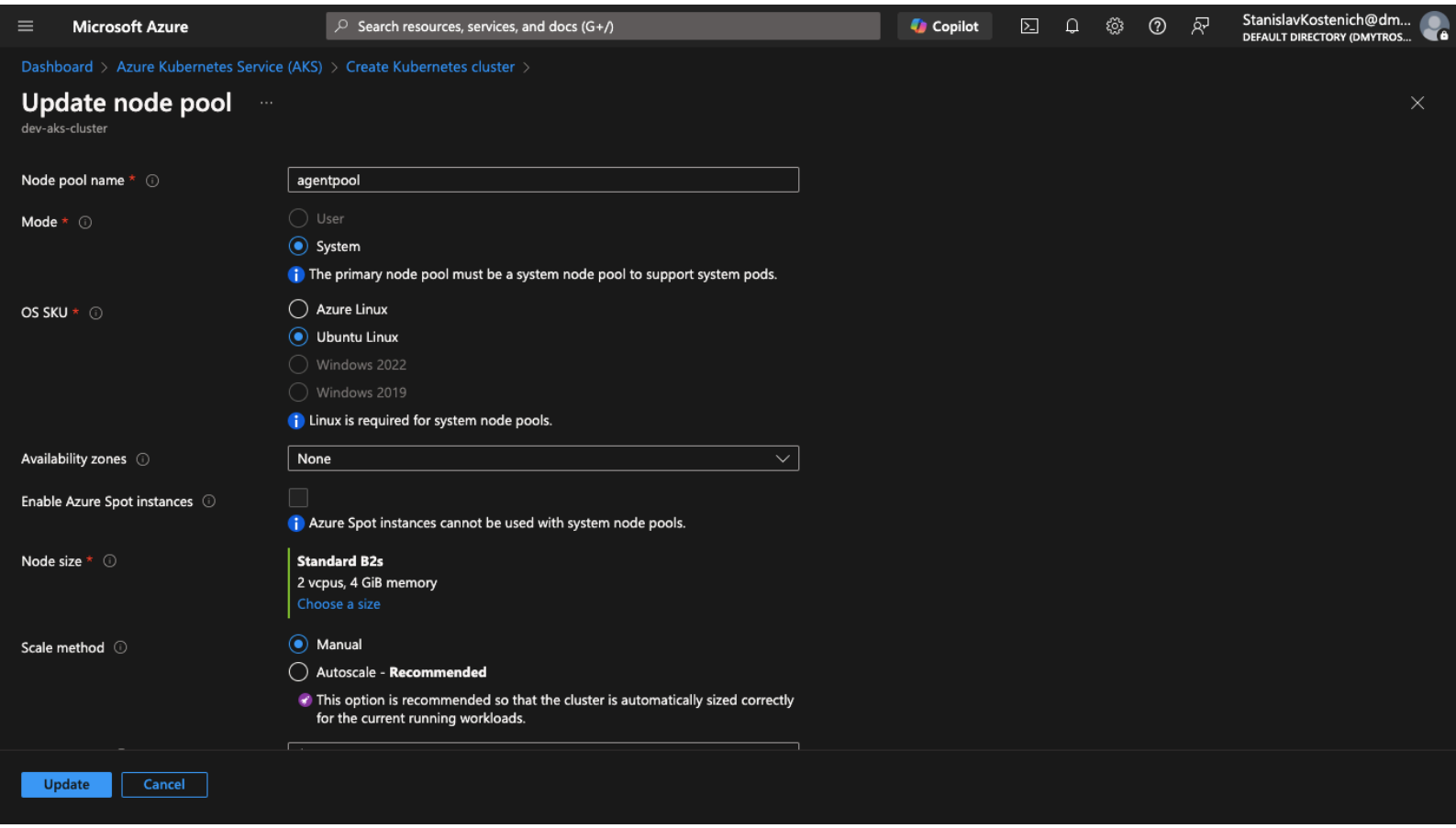

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Switch to PowerShell
Restart
Manage files
New session
Editor
Web preview
Settings
Help
stanislav [~]$ az aks get-credentials --resource-group StanislavKostenich --name dev-aks-cluster
Merged "dev-aks-cluster" as current context in /home/stanislav/.kube/config
stanislav [~]$ kubectl get nodes
NAME STATUS ROLES AGE VERSION
aks-agentpool-13218111-vmss000000 Ready <none> 52m v1.30.7
aks-agentpool-13218111-vmss000001 Ready <none> 11m v1.30.7
stanislav [~]$ kubectl create deployment nginx --image=nginx --replicas=1
deployment.apps/nginx created
stanislav [~]$ kubectl expose deployment nginx --port=80 --type=LoadBalancer
service/nginx exposed
stanislav [~]$ kubectl get services
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.0.0.1 <none> 443/TCP 54m
nginx LoadBalancer 10.0.151.67 64.236.63.178 80:31137/TCP 12s
stanislav [~]$ curl -i http://64.236.63.178 | jq
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 615 100 615 0 0 3262 0 --:--:-- --:--:-- --:--:-- 3271
parse error: Invalid numeric literal at line 1, column 9
stanislav [~]$ curl -i http://64.236.63.178
HTTP/1.1 200 OK
Server: nginx/1.27.3
Date: Thu, 30 Jan 2025 13:02:02 GMT
Content-Type: text/html
Content-Length: 615
Last-Modified: Tue, 26 Nov 2024 15:55:00 GMT
Connection: keep-alive
ETag: "6745ef54-267"
Accept-Ranges: bytes
<!DOCTYPE html>

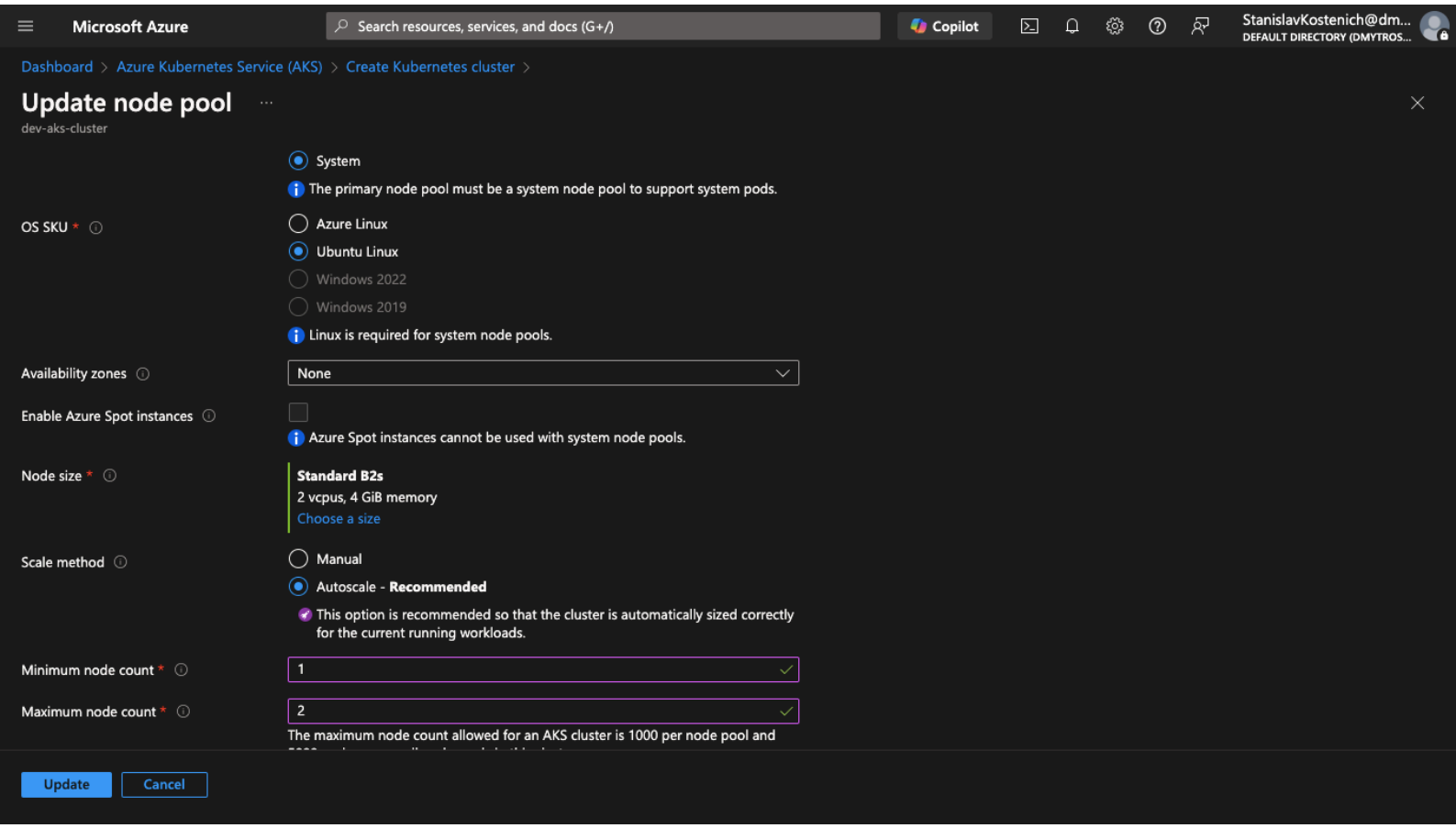

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > microsoft.aks-1738238642592 | Overview >
dev-aks-cluster
Kubernetes service
Search
Overview
Activity log
Access control (IAM)
Tags
Monitor
Diagnose and solve problems
Microsoft Defender for Cloud (preview)
Cost analysis
Kubernetes resources
Namespaces
Workloads
Services and ingresses
Storage
Configuration
Custom resources
Events
Run command
Settings
Node pools
Cluster configuration
Security configuration
Create
Connect
Start
Stop
Delete
Refresh
Open in mobile
Give feedback
Essentials
JSON View
Resource group : StanislavKostenich
Power state : Running
Cluster operation status : Succeeded
Subscription : Azure subscription 1
Location : Central US
Subscription ID : 9a6ae428-d8c3-44fe-bdf2-4e08593901a0
Tags (edit) : Add tags
Kubernetes version : 1.30.7
API server address : dev-aks-cluster-dns-mpj8e2l3.hcp.centralus.azmk8s.io
Network configuration : Azure CNI Overlay
Node pools : 1 node pool
Container registries : Attach a registry
Get started
Properties
Monitoring
Capabilities (5)
Recommendations (0)
Kubernetes services
Encryption type Encryption at-rest with a platform-managed key
Virtual node pools Not enabled
Node pools
Node pools 1 node pool
Kubernetes versions 1.30.7
Node sizes Standard_D2s_v3
Configuration
Kubernetes version 1.30.7
Auto Upgrade Type Patch
Automatic upgrade scheduler Every week on Sunday (recommended)
Networking
API server address
dev-aks-cluster-dns-mpj8e2l3.hcp.centralus.azmk8s.io
Network configuration Azure CNI Overlay
Pod CIDR 10.244.0.0/16
Service CIDR 10.0.0.0/16
DNS service IP 10.0.0.10
Cilium dataplane Not enabled
Network Policy None
Load balancer Standard
Private cluster Not enabled
Authorized IP ranges Enabled
IP ranges 91.210.250.95/32

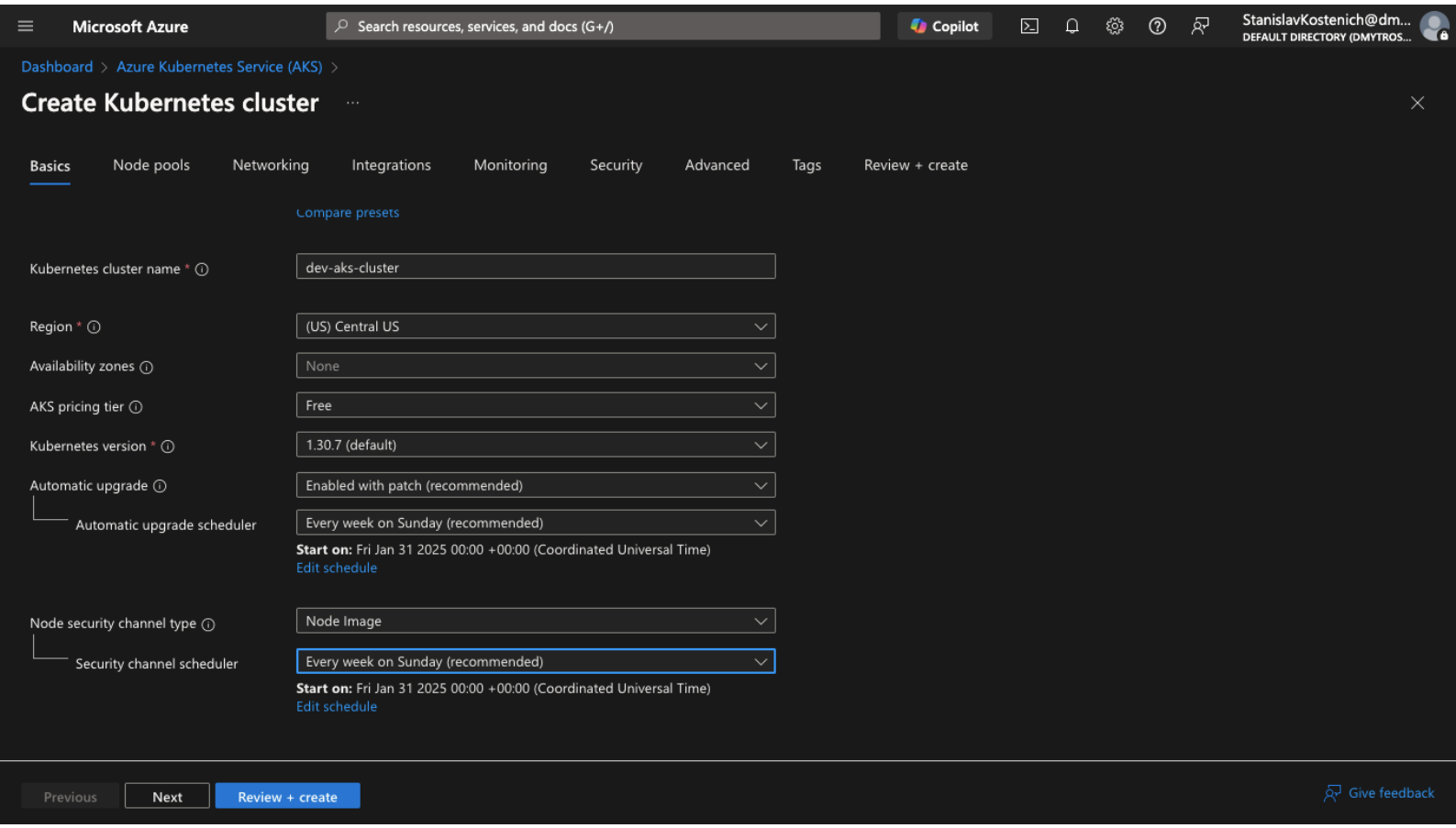

azure_star
Study - Ar
app.landin
CloudWat
Simple We
12 notifica
Create Kul
Azure Dev
Check you
portal.azure.com/#create/microsoft.aks
90%
Reset
Basics
Node pools
Networking
Integrations
Monitoring
Security
Advanced
Tags
Review + create
Enable a private cluster to restrict worker node to API access, enhancing your Kubernetes workload's security and isolation.
Enable private cluster
Public access
Set authorized IP ranges
Specify IP ranges *
91.210.250.95
Container networking
Network configuration
Azure CNI Overlay
Assigns pod IP addresses from a private IP space. Best for scalability
Azure CNI Node Subnet
Previously named Azure CNI. Assigns pod IP addresses from your host VNet. Best for workloads where pods must be reachable by other VNet resources
kubenet
Older, route table-based Overlay with limited scalability. Not recommended for most clusters
Bring your own Azure virtual network
DNS name prefix *
dev-aks-cluster-dns
Enable Cilium dataplane and network policy
Previous
Next
Review + create
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > Azure Kubernetes Service (AKS) > Create Kubernetes cluster >
Update node pool
dev-aks-cluster
Mode *
User
System
The primary node pool must be a system node pool to support system pods.
OS SKU *
Azure Linux
Ubuntu Linux
Windows 2022
Windows 2019
Linux is required for system node pools.
Availability zones
None
Enable Azure Spot instances
Azure Spot instances cannot be used with system node pools.
Node size *
Standard D2s v3
2 vcpus, 8 GiB memory
Choose a size
Scale method
Manual
Autoscale - Recommended
This option is recommended so that the cluster is automatically sized correctly for the current running workloads.
Node count *
1
Update
Cancel


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > Azure Kubernetes Service (AKS) >
Create Kubernetes cluster
Basics
Node pools
Networking
Integrations
Monitoring
Security
Advanced
Tags
Review + create
Node pools
In addition to the required primary node pool configured on the Basics tab, you can also add optional node pools to handle a variety of workloads Learn more
Add node pool
Delete
Name
Mode
Node size
OS SKU
Node count
Availat
agentpool
System
Standard_B2s (cha...
Ubuntu
1
None
B-series node sizes cannot be scheduled. Select another node size.
Enable virtual nodes
Virtual nodes allow burstable scaling backed by serverless Azure Container Instances. Learn more
Enable virtual nodes
Node pool OS disk encryption
Previous
Next
Review + create
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > Azure Kubernetes Service (AKS) > Create Kubernetes cluster >
Update node pool
dev-aks-cluster
Node pool name *
agentpool
Mode *
User
System
The primary node pool must be a system node pool to support system pods.
OS SKU *
Azure Linux
Ubuntu Linux
Windows 2022
Windows 2019
Linux is required for system node pools.
Availability zones
None
Enable Azure Spot instances
Azure Spot instances cannot be used with system node pools.
Node size *
Standard B2s
2 vcpus, 4 GiB memory
Choose a size
Scale method
Manual
Autoscale - Recommended
This option is recommended so that the cluster is automatically sized correctly for the current running workloads.
Update
Cancel


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > Azure Kubernetes Service (AKS) > Create Kubernetes cluster >
Update node pool
dev-aks-cluster
System
The primary node pool must be a system node pool to support system pods.
OS SKU *
Azure Linux
Ubuntu Linux
Windows 2022
Windows 2019
Linux is required for system node pools.
Availability zones
None
Enable Azure Spot instances
Azure Spot instances cannot be used with system node pools.
Node size *
Standard B2s
2 vcpus, 4 GiB memory
Choose a size
Scale method
Manual
Autoscale - Recommended
This option is recommended so that the cluster is automatically sized correctly for the current running workloads.
Minimum node count *
1
Maximum node count *
2
The maximum node count allowed for an AKS cluster is 1000 per node pool and
Update
Cancel


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
StanislavKostenich@dm...
DEFAULT DIRECTORY (DMYTROS...
Dashboard > Azure Kubernetes Service (AKS) >
Create Kubernetes cluster
Basics
Node pools
Networking
Integrations
Monitoring
Security
Advanced
Tags
Review + create
Compare presets
Kubernetes cluster name *
dev-aks-cluster
Region *
(US) Central US
Availability zones
None
AKS pricing tier
Free
Kubernetes version *
1.30.7 (default)
Automatic upgrade
Enabled with patch (recommended)
Automatic upgrade scheduler
Every week on Sunday (recommended)
Start on: Fri Jan 31 2025 00:00 +00:00 (Coordinated Universal Time)
Edit schedule
Node security channel type
Node Image
Security channel scheduler
Every week on Sunday (recommended)
Start on: Fri Jan 31 2025 00:00 +00:00 (Coordinated Universal Time)
Edit schedule
Previous
Next
Review + create
Give feedback

4. Remove the ACI container after verifying secure access.

Practical Task 5: Deploy a Kubernetes Cluster with AKS via Azure Portal

Requirements:

1. Create an Azure Kubernetes Service (AKS) cluster with the smallest VM size (e.g., B2s) and the minimum number of nodes (e.g., 1–2).
2. Connect to the AKS cluster using Azure Cloud Shell with kubectl.
3. Deploy a lightweight Nginx application for verification.
4. Delete the AKS cluster immediately after testing to avoid additional VM and cluster costs.

Practical Task 6: Deploy a Containerized Application on AKS

Requirements:

1. Build a lightweight Docker image for a simple web application (e.g., a Node.js app with minimal dependencies) and push it to Azure Container Registry (ACR).
2. Reuse the AKS cluster from Task 5 to deploy the application using a Kubernetes deployment