

Future Ready Talent - Project Documentation

Name – Shubham Vishwakarma

Project Title – NetMaze-Explorer

Industry Type : Ed-tech

Project Title : NetMaze-Explorer

Problem Statement/ Opportunity:

Many organizations require a secure and efficient way to extend their on-premises networks to Azure for various reasons, such as resource scalability, disaster recovery, and data center consolidation. The challenge lies in setting up a hybrid network that ensures data transition is secure and effective, and access controls are in place. Without proper configuration and security measures, transitioning to the cloud can expose an organization to security risks and operational challenges.

Project Description:

The core problem this project tackles is the need for organizations to seamlessly extend their on-premises networks into the Azure cloud. Transitioning to the cloud can be fraught with operational and security hurdles if not executed with the utmost precision.

NetMaze Explorer offers a comprehensive solution through a meticulously crafted step-by-step guide. It leverages an array of Azure services, including Virtual Networks, VPN Gateway, Network Security Groups (NSGs), Bastion, Private Link, and more. These components collaboratively form the foundation for secure connectivity, resource deployment, access control, administrative security, private access to Azure PaaS services, custom DNS configurations, and rigorous performance and security testing.

The solution is articulated clearly, with each step addressing a specific aspect of building a resilient hybrid network. From provisioning Azure Virtual Networks to securing administrative access with Azure Bastion and private access to Azure PaaS services through Private Link, every stage aligns with the overarching problem statement. Additionally, the project emphasizes the importance of ongoing monitoring and auditing to bolster network security and compliance.

In essence, NetMaze Explorer offers a structured and comprehensive answer to the challenge of creating a secure hybrid network that effectively bridges on-premises environments with Azure resources. It aptly caters to the specific need for a secure and efficient networking solution in the cloud, making it an invaluable resource for organizations seeking a robust Azure networking framework.

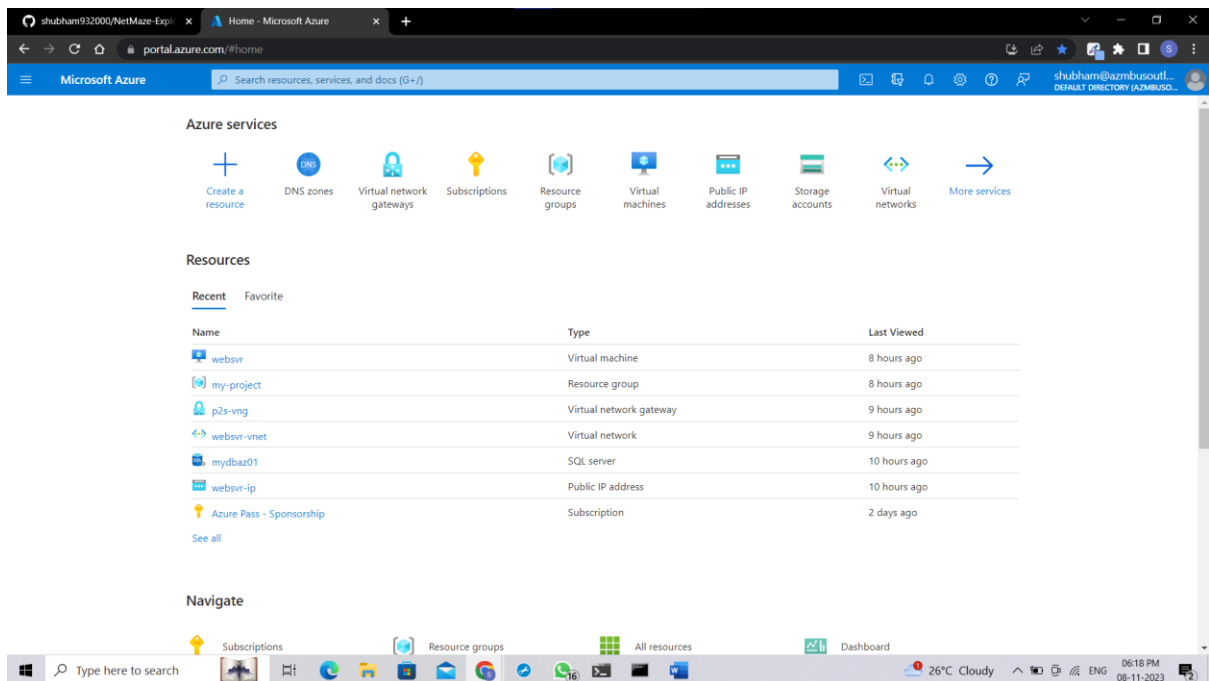
Azure Technologies used

- Azure Virtual Networks
- Azure VPN Gateway
- Network Security Groups (NSGs)
- Azure Bastion
- Azure Private Link
- Azure Disk Storage
- Azure Virtual Desktop
- Azure Virtual Network Manager

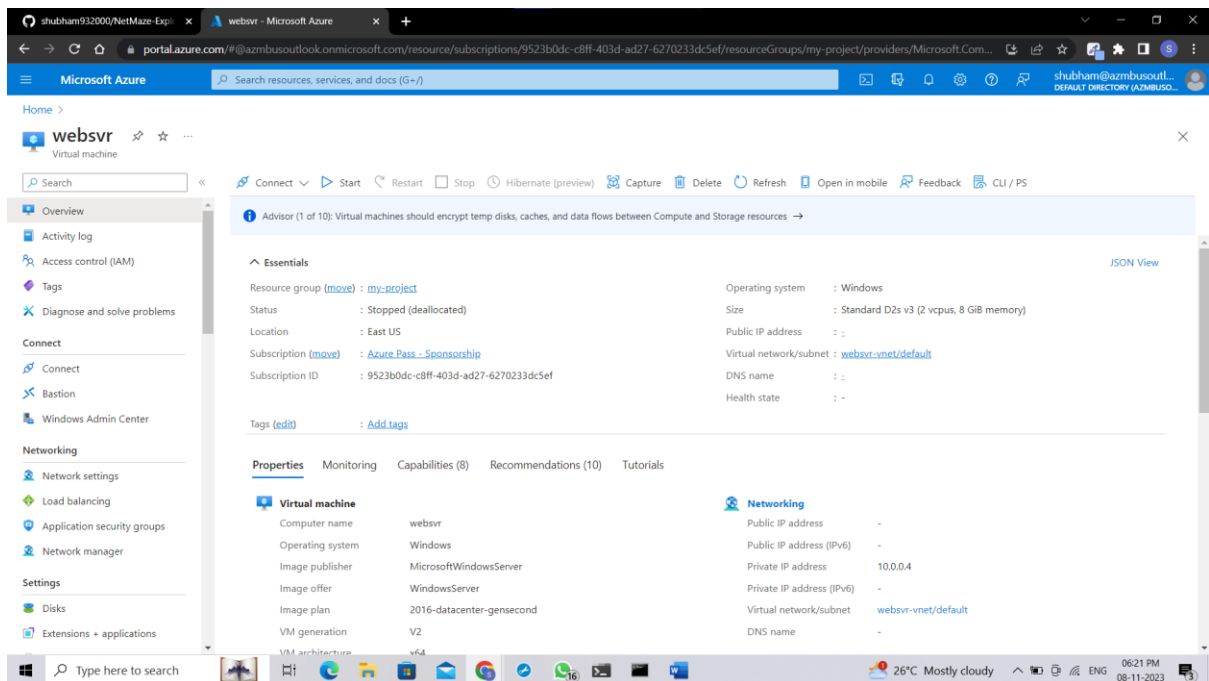
YouTube Link : https://www.youtube.com/watch?v=zw-DvsqmOBE&ab_channel=ShubhamVishwakarma

GitHub link : <https://github.com/shubham932000/NetMaze-Explorer.git>

Services used:



Web Server for project :



Webserver json file:

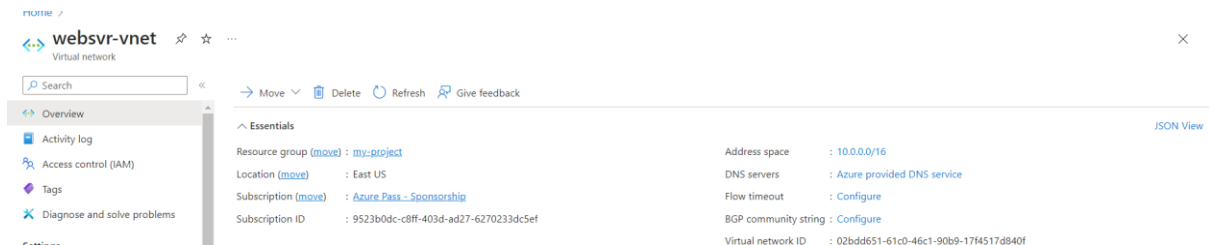
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{
  "name": "websvr",
  "id": "/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Compute/virtualMachines/websvr",
  "type": "Microsoft.Compute/virtualMachines",
  "location": "eastus",
  "properties": {
    "hardwareProfile": {
      "vmSize": "Standard_D2s_v3"
    },
    "provisioningState": "Succeeded",
    "vmId": "d5bd13df-59db-4562-9b28-f7803a0788f0",
    "storageProfile": {
      "imageReference": {
        "publisher": "MicrosoftWindowsServer",
        "offer": "WindowsServer",
        "sku": "2016-datacenter-gensecond",
        "version": "latest",
        "exactVersion": "14393.6351.231007"
      },
      "osDisk": {
        "osType": "Windows",
        "name": "websvr_disk1_7629053d33794ae68d65e7b9a44af340",
        "createOption": "FromImage",
        "caching": "ReadWrite",
        "managedDisk": {
          "id": "/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/MY-
PROJECT/providers/Microsoft.Compute/disks/websvr_disk1_7629053d33794ae68d65e7b9a44af340"
        },
        "deleteOption": "Delete"
      },
      "dataDisks": []
    },
    "osProfile": {
      "computerName": "websvr",
      "adminUsername": "azuser",
      "windowsConfiguration": {
        "provisionVMAgent": true,
        "enableAutomaticUpdates": true,
        "patchSettings": {
          "patchMode": "AutomaticByOS",
          "assessmentMode": "ImageDefault",
          "enableHotpatching": false
        }
      },
      "secrets": [],
      "allowExtensionOperations": true,
      "requireGuestProvisionSignal": true
    },
    "securityProfile": {
      "uefiSettings": {
        "secureBootEnabled": true,
        "vTpmEnabled": true
      },
      "securityType": "TrustedLaunch"
    },
    "networkProfile": {
      "networkInterfaces": [
        {
```

```

      "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/networkInterfaces/websvr801",
      "properties": {
        "deleteOption": "Delete"
      }
    }
  ],
},
"licenseType": "Windows_Server"
}
}

```

Virtual Network setup:



Virtual network json file:

```

{
  "name": "websvr-vnet",
  "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/virtualNetworks/websvr-vnet",
  "etag": "W/\"5e61ea29-886d-4249-82d1-b6741eb56bc1\"",
  "type": "Microsoft.Network/virtualNetworks",
  "location": "eastus",
  "properties": {
    "provisioningState": "Succeeded",
    "resourceGuid": "02bdd651-61c0-46c1-90b9-17f4517d840f",
    "addressSpace": {
      "addressPrefixes": [
        "10.0.0.0/16"
      ]
    },
    "subnets": [
      {
        "name": "default",
        "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/virtualNetworks/websvr-vnet/subnets/default",
        "etag": "W/\"5e61ea29-886d-4249-82d1-b6741eb56bc1\"",
        "properties": {
          "provisioningState": "Succeeded",
          "addressPrefix": "10.0.0.0/24",
          "ipConfigurations": [
            {
              "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/MY-
PROJECT/providers/Microsoft.Network/networkInterfaces/WEBSVR801/ipConfigurations/IPCONFIG1"
            }
          ]
        },

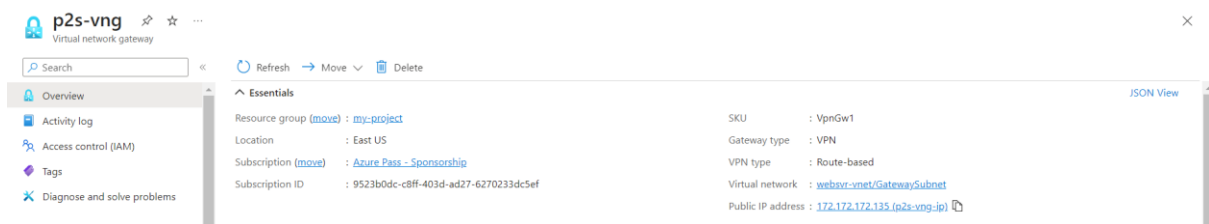
```

```

    "type": "Microsoft.Network/virtualNetworks/subnets"
  },
  {
    "name": "GatewaySubnet",
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    "etag": "W/\"5e61ea29-886d-4249-82d1-b6741eb56bc1\"",
    "properties": {
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      "ipConfigurations": [
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        }
      ]
    }
  },
  {
    "type": "Microsoft.Network/virtualNetworks/subnets"
  }
]
}
}

```

VNG:



VNG json file:

```

{
  "name": "p2s-vng",
  "id": "/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-project/providers/Microsoft.Network/virtualNetworkGateways/p2s-vng",
  "etag": "W/\"e0a6f807-f6ee-4bbc-83d9-b671e7b662e9\"",
  "type": "Microsoft.Network/virtualNetworkGateways",
  "location": "eastus",
  "tags": {},
  "properties": {
    "provisioningState": "Succeeded",
    "resourceGuid": "e1f5388d-e12a-4b74-9602-72349c90f547",
    "enablePrivateIpAddress": false,
    "ipConfigurations": [
      {
        "name": "default",
        "id": "/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-project/providers/Microsoft.Network/virtualNetworkGateways/p2s-vng/ipConfigurations/default",
        "etag": "W/\"e0a6f807-f6ee-4bbc-83d9-b671e7b662e9\"",
        "type": "Microsoft.Network/virtualNetworkGateways/ipConfigurations",
        "properties": {
          "provisioningState": "Succeeded",
          "privateIPAllocationMethod": "Dynamic",
          "publicIpAddress": {
            "id": "/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-project/providers/Microsoft.Network/publicIPAddresses/p2s-vng-ip"
          },
          "subnet": {

```

```

      "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/virtualNetworks/websvr-vnet/subnets/GatewaySubnet"
    }
  }
},
"virtualNetworkGatewayPolicyGroups": [],
"sku": {
  "name": "VpnGw1",
  "tier": "VpnGw1",
  "capacity": 2
},
"gatewayType": "Vpn",
"vpnType": "RouteBased",
"enableBgp": false,
"activeActive": false,
"vpnClientConfiguration": {
  "vpnClientAddressPool": {
    "addressPrefixes": [
      "192.168.1.0/24"
    ]
  },
  "vpnClientProtocols": [
    "IkeV2"
  ],
  "vpnClientRootCertificates": [
    {
      "name": "root",
      "id":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/virtualNetworkGateways/p2s-vng/vpnClientRootCertificates/root",
      "etag": "W\\\"e0a6f807-f6ee-4bbc-83d9-b671e7b662e9\\\"",
      "properties": {
        "provisioningState": "Succeeded",
        "publicCertData":
"MIIC5zCCAC+gAwIBAgIQeOo7aWq0u5ZP8r5P28/QRjANBgkqhkiG9w0BAQsFADAW
MRQwEgYDVQQLDAtQMINSb290Q2VydDAeFw0yMzExMDIxMTAzMDhaFw0yNTExMDIx
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QT3nvMTGfYxseei5kO4/sjLhklVwyeEGAf/yhKA7HAOBaH9J9NvHnpuEXyszuH
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      },
      "type": "Microsoft.Network/virtualNetworkGateways/vpnClientRootCertificates"
    }
  ],
  "vpnClientRevokedCertificates": [],
  "vngClientConnectionConfigurations": [],
  "vpnClientConnectionHealth": {
    "vpnClientConnectionsCount": 0,
    "totalIngressBytesTransferred": 0,
    "totalEgressBytesTransferred": 0
  },
  "radiusServers": [],
  "vpnClientIpsecPolicies": []
},
"bgpSettings": {
  "asn": 65515,
  "bgpPeeringAddress": "10.0.1.62",
  "peerWeight": 0,
  "bgpPeeringAddresses": [
    {
      "ipconfigurationId":
"/subscriptions/9523b0dc-c8ff-403d-ad27-6270233dc5ef/resourceGroups/my-
project/providers/Microsoft.Network/virtualNetworkGateways/p2s-vng/ipConfigurations/default",
      "defaultBgpIpAddresses": [

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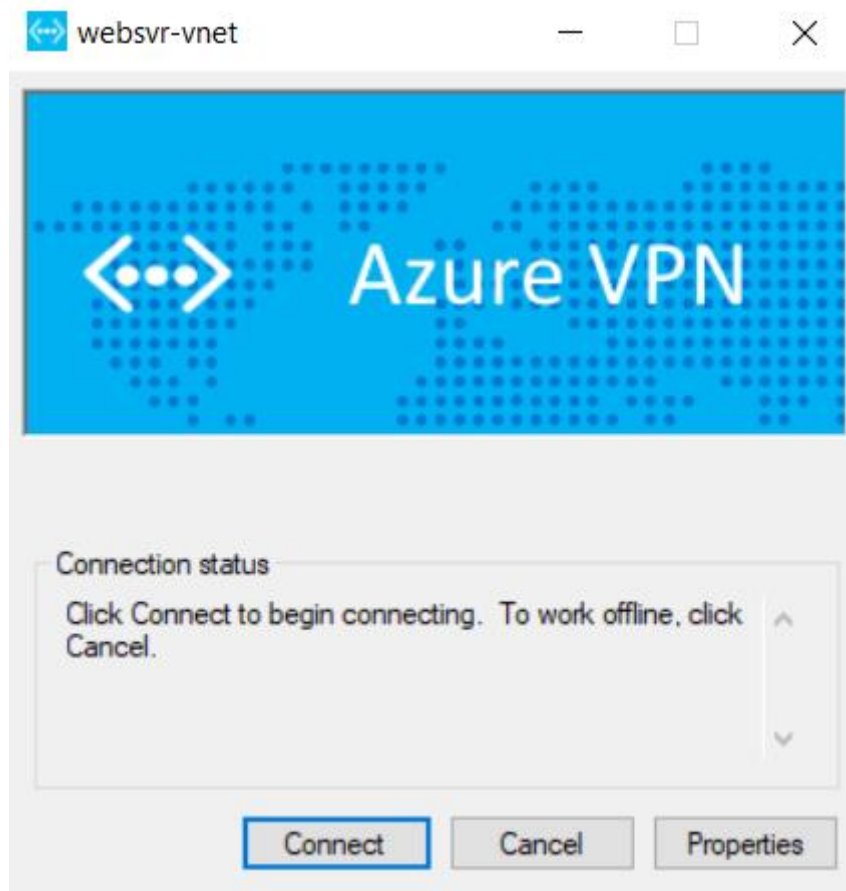
        "10.0.1.62"
      ],
      "customBgpIpAddresses": [],
      "tunnelIpAddresses": [
        "172.172.172.135"
      ]
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  "vpnGatewayGeneration": "Generation1"
}

```

Project Architecture:

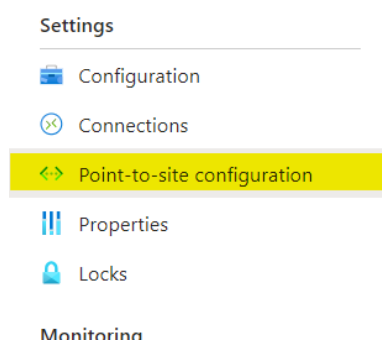


VPN Client :



To download the VPN client for private connection we can follow the steps below.

1. Go to the VNG setting section and then select Point to site configuration



2. After configuration click on the download button.

« Save Discard Delete Download VPN client

Address pool *

192.168.1.0/24 ✓

Tunnel type


IKEv2 ▼

Authentication type

3. After downloading the zip file extract the folder named as WindowsAmd64



4. Then click on VpnClientSetupAmd64 to install the VPN client

 VpnClientSetupAmd64.exe	06-11-2023 11:30 AM	Application	216 KB
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