

## Configuring Azure Virtual Network for Microsoft Azure Synapse SQL

## Abstract

You can use a Microsoft Azure Synapse SQL connection to connect to a Microsoft Azure Synapse SQL endpoint that resides in the Azure Virtual Network. This article explains how to configure a virtual network to create a secure and scalable, on-demand Azure infrastructure on Azure cloud.

## Supported Versions

- Informatica Cloud® Data Integration Microsoft Azure Synapse SQL Connector

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## Overview

Azure Virtual Network (VNet) enables many types of Azure resources, such as Azure Virtual Machines, to securely communicate with each other, the internet, and on-premises networks.

You can create a virtual network in the Azure portal to securely communicate with a Microsoft Azure Synapse SQL endpoint.

Before you connect to a Microsoft Azure Synapse SQL endpoint residing in a virtual network, perform the following prerequisite tasks:

1. Create a virtual network in Azure.
2. Add a subnet to the virtual network.
3. Create a virtual machine.
4. Create a virtual network rule.
5. Configure the Microsoft SQL Server database that hosts Microsoft Azure Synapse SQL to read from and write data to Azure storage.
6. Enable the virtual network for the Microsoft Azure Synapse SQL connection.

## Creating a virtual network

Perform the following steps to create a virtual network in Azure:

1. Log in to the Azure portal
2. In the search box, enter **Virtual network**, and select **Virtual network** in the search results.
3. On the Virtual network page, click **Create**.

Home >

## Virtual networks

Informatica (informatica.onmicrosoft.com)

[+ Create](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Assign tags](#) [Feedback](#)

Filter for any field... Subscription == all Resource group == all Location == all [Add filter](#)

Showing 1 to 20 of 20 records.

<input type="checkbox"/> Name ↑↓	Resource group ↑↓	Location ↑↓
<input type="checkbox"/> az-bec-test-vnet	az-bec-test	West Europe
<input type="checkbox"/> AzureBLR	AzureRnD	East US 2
<input type="checkbox"/> AzureLinux_group-vnet	AzureLinux_group	East US
<input type="checkbox"/> azurelinuxm_group-vnet	azurelinuxm_group	East US 2
<input type="checkbox"/> AzurePerf-vnet	AzurePerf	West US 2
<input type="checkbox"/> AzurePerfvnet775	AzurePerf	Central India
<input type="checkbox"/> AzurePerfvnet910	AzurePerf	East US 2

4. On the Basics tab, enter the project and instance details.

Home > Virtual networks >

## Virtual networks

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Filter for any field...

**Name** ↑↓

- az-bec-test-vnet
- AzureBLR
- AzureLinux\_group-vnet
- azurelinuxm\_group-vnet
- AzurePerf-vnet
- AzurePerfvnet775
- AzurePerfvnet910
- AzureRnD-vnet
- AzureRnDvnet927
- AzureRnDvnet997
- Gen2Vnet
- infa-vnet-7fq4v7nlpsubpxpjy6ksuz

### Create virtual network

[Basics](#) [IP Addresses](#) [Security](#) [Tags](#) [Review + create](#)

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation. [Learn more about virtual network](#)

**Project details**

Subscription \*

Resource group \*  [Create new](#)

**Instance details**

Name \*

Region \*

[Review + create](#) [< Previous](#) [Next: IP Addresses >](#) [Download a template for automation](#)

- In the **Subscription** field, select your subscription for which you want to create the virtual network.
- In the **Resource group** field, select the resource group in which the Azure resources are deployed and managed.
- In the **Name** field, enter a name for the virtual network.
- In the **Region** field, select the region

**Note:** Ensure that the virtual network and all the Azure resources are in the same region.

5. Click **Next: IP Addresses**.

The IP Addresses tab shows the IP address space of the virtual network and the address range of the subnet.


# Create virtual network ...

Basics **IP Addresses** Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

### IPv4 address space



10.6.0.0/16 10.6.0.0 - 10.6.255.255 (65536 addresses) 

Add IPv6 address space 

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

[+](#) Add subnet  Remove subnet

<input type="checkbox"/> Subnet name	Subnet address range	NAT gateway
<input type="checkbox"/> default	10.6.0.0/24	-

 Use of a NAT gateway is recommended for outbound internet access from a subnet. You can deploy a NAT gateway and assign it to a subnet after you create the virtual network. [Learn more](#) 

[Review + create](#)

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[Next : Security >](#)

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You can use the default subnet or add a new subnet. The subnet address range must be contained by the address space of the virtual network.

6. Click **Review + Create**, verify the configurations, and click **Create**.

## Create virtual network ...

✔ Validation passed

Basics IP Addresses Security Tags Review + create

### Basics

Subscription	Azure R&D CTG IND_Connectivity
Resource group	AzureRnD
Name	pvt_Vnet_sd
Region	West US

### IP addresses

Address space	10.6.0.0/16
Subnet	default (10.6.0.0/24)

### Tags

None

### Security

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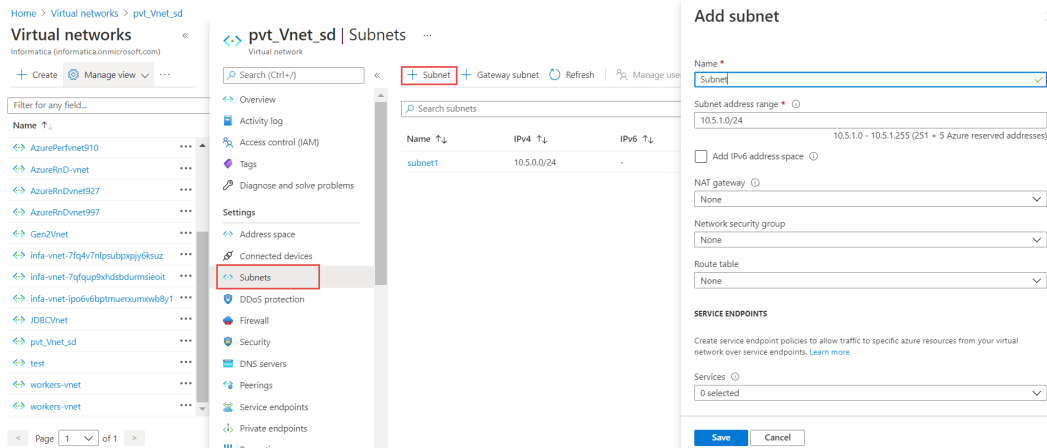
[Next >](#)

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## Adding a subnet to the virtual network

A subnet is a range of IP addresses in the virtual network. You can segment the virtual network into one or more sub-networks and allocate a portion of the virtual network's address space to each subnet. You can then deploy Azure resources in a specific subnet.

1. Go to the virtual network that you created.
2. Under **Settings**, click **Subnets**.

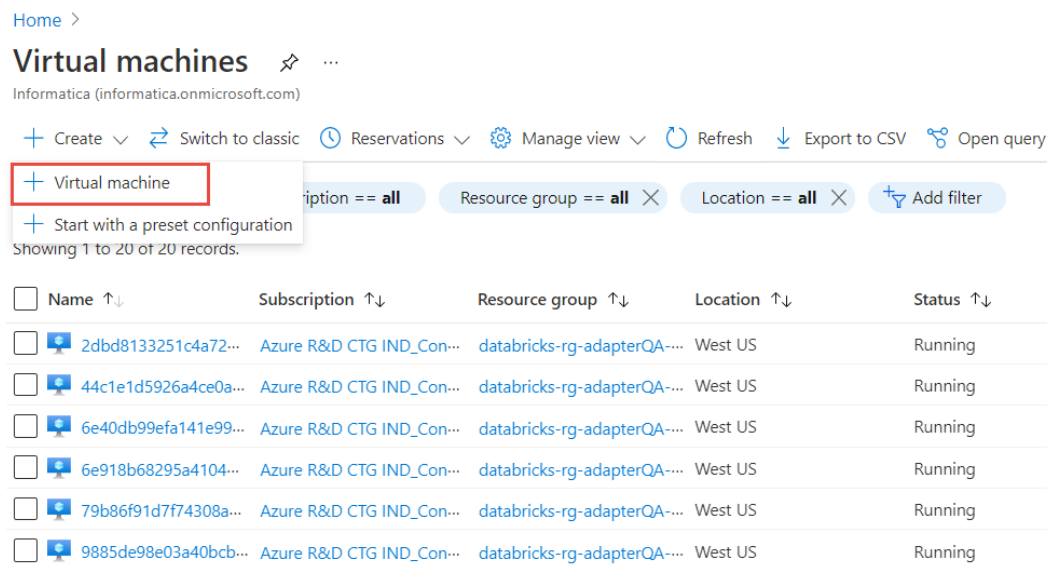


3. Click **Subnet**.  
The **Add subnet** page appears.
4. Enter a name for the subnet.
5. You can use the default subnet address range or specify an address range as per requirement.  
The subnet address range must be contained by the address space of the virtual network. The address range of a subnet which is in use cannot be edited.
6. Click **Save**.

## Creating a virtual machine in the subnet

Perform the following steps to create a virtual machine:

1. In the search box, enter **Virtual machines**, and select **Virtual machines** in the search results.
2. Click **Create > Virtual machine**.



3. On the **Basics** tab, enter the project, instance, and authentication details.

Home > Virtual machines >

## Virtual machines

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+ Create Switch to classic

Filter for any field...

Name	Subscription
2dbd8133251c4a...	Azure R&D CTG
44c1e1d5926a4ce...	Azure R&D CTG
6e40db99efa141e...	Azure R&D CTG
6e918b68295a41...	Azure R&D CTG
79b86f91d7f7430...	Azure R&D CTG
9885de98e03a40...	Azure R&D CTG
AzureLinuxVM	Azure R&D CTG
be6300a96e5842...	Azure R&D CTG
cef16d680a0647b...	Azure R&D CTG
d366f9964348407...	Azure R&D CTG
e52305feb5ed4a2...	Azure R&D CTG
efe94dc481fe449...	Azure R&D CTG
f102920b1dd4431...	Azure R&D CTG
f4fab99c5f4e4b8d...	Azure R&D CTG
ilabsAzurVnet	Azure R&D CTG
ilabspfindiaregi...	Azure R&D CTG

## Create a virtual machine

Basics Disks Networking Management Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \*

Resource group \*  [Create new](#)

### Instance details

Virtual machine name \*

Region \*

Availability options

Image \*  [See all images](#)

Azure Spot instance

Size \*  [See all sizes](#)

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- In the **Subscription** field, select the subscription for which you want to create the virtual machine.
- In the **Resource group** field, select the resource group in which the Azure resources are deployed and managed.
- In the **Virtual machine name** field, enter a name for the virtual machine.  
The virtual machine name cannot be changed after the virtual machine is created.
- In the **Region** field, select the region.  
**Note:** Ensure that the subscription, resource group, and region for the virtual machine are the same as that of the virtual network.
- In the **Availability** options field, you can choose to replicate the virtual machine in availability zones or availability sets to protect your applications and data from datacenter outages and maintenance events.
- In the **Image** field, select the base operating system or application for the virtual machine.
- In the **Size** field, select the size of the virtual machine that determines factors such as processing power, memory, and storage capacity.
- In the Authentication type field, select if the administrator account will use username and password or SSH keys for authentication.

## Create a virtual machine ...

### Administrator account

Authentication type ⓘ

- SSH public key  
 Password

**i** Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.

Username \* ⓘ

azureuser ✓

SSH public key source

Generate new key pair ▾

Key pair name \*

Name the SSH public key

### Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports \* ⓘ

- None  
 Allow selected ports

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If you select the **SSH public key** option, enter the username and key pair name.

If you select the **Password** option, enter the username, password, and confirm password.

- i. In the **Public inbound ports** field, select **None**.
4. Click **Next : Disks**.
5. On the **Disks** tab, you can select the disk type for your virtual machine or use the default disk type. You can also configure additional data disks or attach existing disks.



Basics **Disks** Networking Management Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

#### Disk options

OS disk type \* ⓘ Premium SSD (locally-redundant storage) ▼

SSE encryption type \* (Default) Encryption at-rest with a platform-managed key ▼

Enable Ultra Disk compatibility ⓘ

#### Data disks

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching
-----	------	------------	-----------	--------------

[Create and attach a new disk](#) [Attach an existing disk](#)

▼ Advanced

6. Click **Next : Networking**.
7. On the **Networking** tab, select the virtual network and the subnet that you created.

## Create a virtual machine ...


Basics Disks **Networking** Management Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

### Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network * ⓘ	<input type="text" value="AzureRnDvnet927"/> <input type="button" value="v"/> <a href="#">Create new</a>
Subnet * ⓘ	<input type="text" value="default (10.0.1.0/24)"/> <input type="button" value="v"/> <a href="#">Manage subnet configuration</a>
Public IP ⓘ	<input type="text" value="None"/> <input type="button" value="v"/> <a href="#">Create new</a>
NIC network security group ⓘ	<input type="radio"/> None <input checked="" type="radio"/> Basic <input type="radio"/> Advanced
Public inbound ports * ⓘ	<input type="radio"/> None <input checked="" type="radio"/> Allow selected ports
Select inbound ports *	<input type="text" value="SSH (22)"/> <input type="button" value="v"/>

 **This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

[Review + create](#)

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8. Click **Review + create**.
9. On the **Review + create** tab, verify the configurations for the virtual machine.

## Create a virtual machine ...

✓ Validation passed

### Basics

Subscription	Azure R&D CTG IND_Connectivity
Resource group	AzureRnD
Virtual machine name	demovm
Region	West US
Availability options	No infrastructure redundancy required
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Username	admin123
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

### Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Ephemeral OS disk	No

### Networking

Virtual network	AzureRnDvnet927
Subnet	default (10.0.1.0/24)
Public IP	(new) demovm-ip

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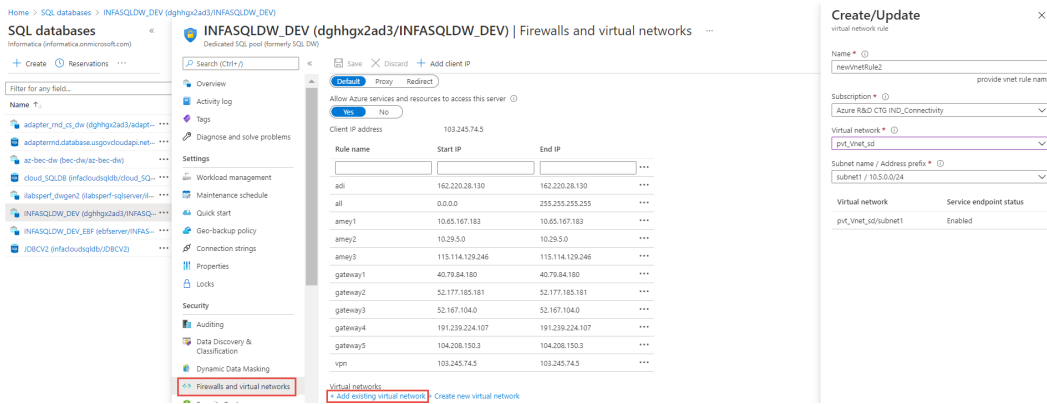
10. Click **Create**.

## Creating a virtual network rule

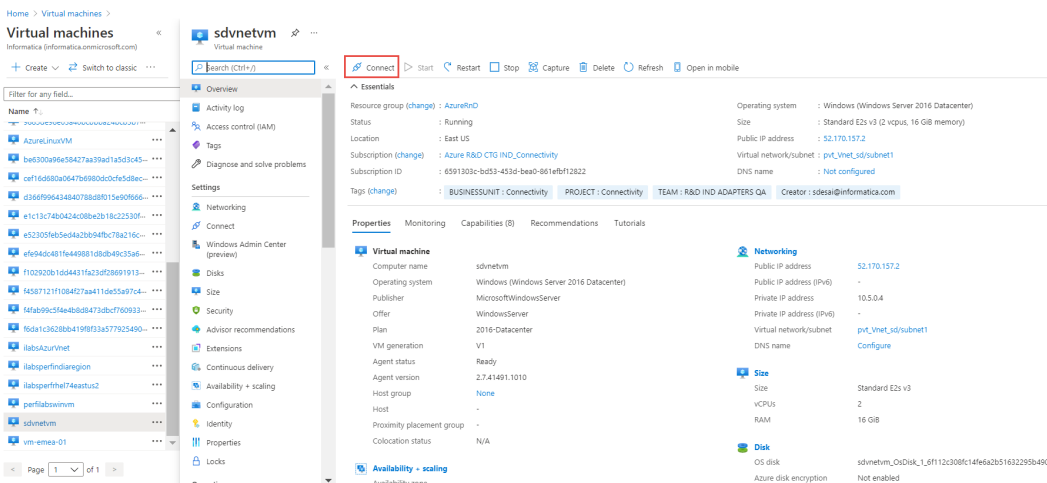
To allow the virtual network to access Microsoft Azure Synapse SQL, create a virtual network rule.

Perform the following steps to create a virtual network rule:

1. Go to your Microsoft Azure Synapse SQL account.
2. In the **Security** section, click **Firewalls and virtual networks**.
3. Under Virtual networks, click **Add existing virtual network**.



4. In the **Name** field, enter a name for the virtual network rule.
5. In the **Subscription** field, select the subscription for the virtual network rule.
6. In the **Virtual network** field, select the virtual network that you created, to allow access to Microsoft Azure Synapse SQL.
7. In the **Subnet name** field, select the subnet.
8. Click **OK**.
9. Go to the virtual machine that you created in the subnet, and click **Connect**.



## Configuring the Microsoft SQL Server database

You must configure the Microsoft SQL Server database that hosts Microsoft Azure Synapse SQL to read from and write data to Azure storage.

Ensure that the Azure storage account is a StorageV2 (general purpose v2) account.

Perform the following steps to configure the Microsoft SQL Server database:

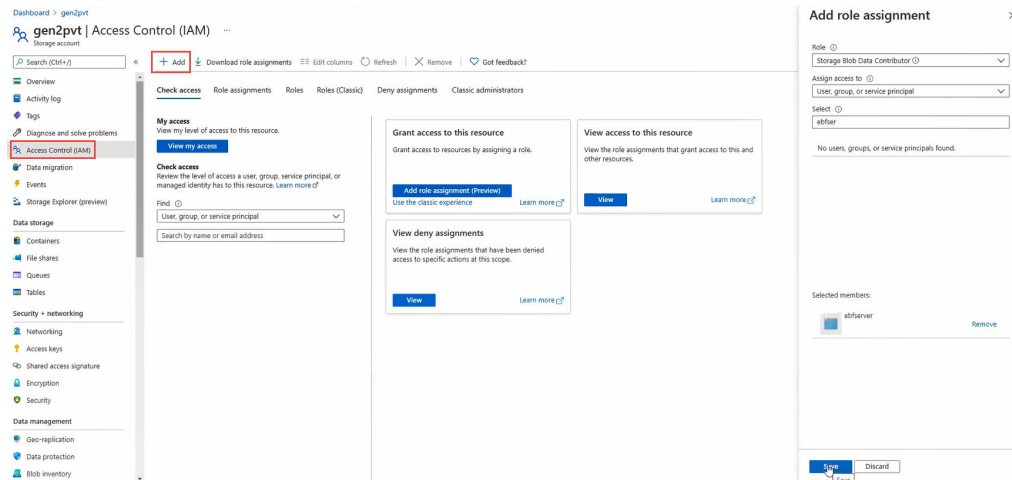
1. Assign managed identity to the Microsoft SQL Server database to allow access to Azure storage.

Open the Windows PowerShell command prompt window and run the following command:

```
Connect-AzAccount Select-AzSubscription -SubscriptionId <your-subscriptionId> Set-AzSqlServer -ResourceGroupName <your-database-server-resourceGroup> -ServerName <your-database-servername> -AssignIdentity
```

2. Assign the Storage Blob Data Contributor role to the Microsoft SQL Server database to read from and write data to Azure storage.

- a. Log in to the Azure portal and go to the Azure storage account.



- b. Click **Add**.
  - c. In the **Role** field, select **Storage Blob Data Contributor**.
  - d. In the **Assign access to** field, select **User, group, or service principal**.
  - e. In the **Select** field, select the Microsoft SQL Server database to which you want to assign the role.
  - f. Click **Save**.
3. Configure the Azure Storage firewalls and virtual networks for the Microsoft SQL Server database.
    - a. In the **Security + Networking** section of the Azure storage account, click **Networking**.
    - b. On the **Firewalls and virtual networks** tab, add the virtual network that you created under **Virtual Networks**.
    - c. Under **Resource instances**, add the Microsoft SQL Server database that hosts Microsoft Azure Synapse SQL to which you want to allow access to the Azure storage.

## Enabling virtual network for Microsoft Azure Synapse SQL connection

After you complete the prerequisites tasks, enable the virtual network for Microsoft Azure Synapse SQL connection:

1. Log in to Informatica Intelligent Cloud Services.
2. Click **Administrator**.
3. Edit an existing connection or create a new connection.

4. Enable the virtual network in the connection properties.

**Connection Details**

Connection Name:*	<input type="text" value="AzureSynapse"/>
Description:	<input type="text"/>
Type:*	<input type="text" value="Microsoft Azure Synapse SQL"/>

**Microsoft Azure Synapse SQL Properties**

Runtime Environment:*	<input type="text" value="Demo_Agent2"/>
-----------------------	--

**Connection Section**

Azure DW JDBC URL:*	<input type="text" value="jdbc:sqlserver://dghhgx2ad3.database.windows.r"/>
Azure DW JDBC Username:*	<input type="text" value="infadwadmin"/>
Azure DW JDBC Password:*	<input type="password" value="....."/>
Azure DW Schema Name:*	<input type="text" value="test"/>
Azure Storage Type:	<input type="text" value="Azure Blob"/>
Authentication Type:	<input type="text" value="Shared Key Authentication"/>
Azure Blob Account Name:	<input type="text" value="gen2pvt"/>
Azure Blob Account Key:	<input type="password" value="....."/>
Blob End-point:	<input type="text" value="core.windows.net"/>
VNet Rule:	<input checked="" type="checkbox"/>

## Author

Adrija Pandya

## Acknowledgements

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