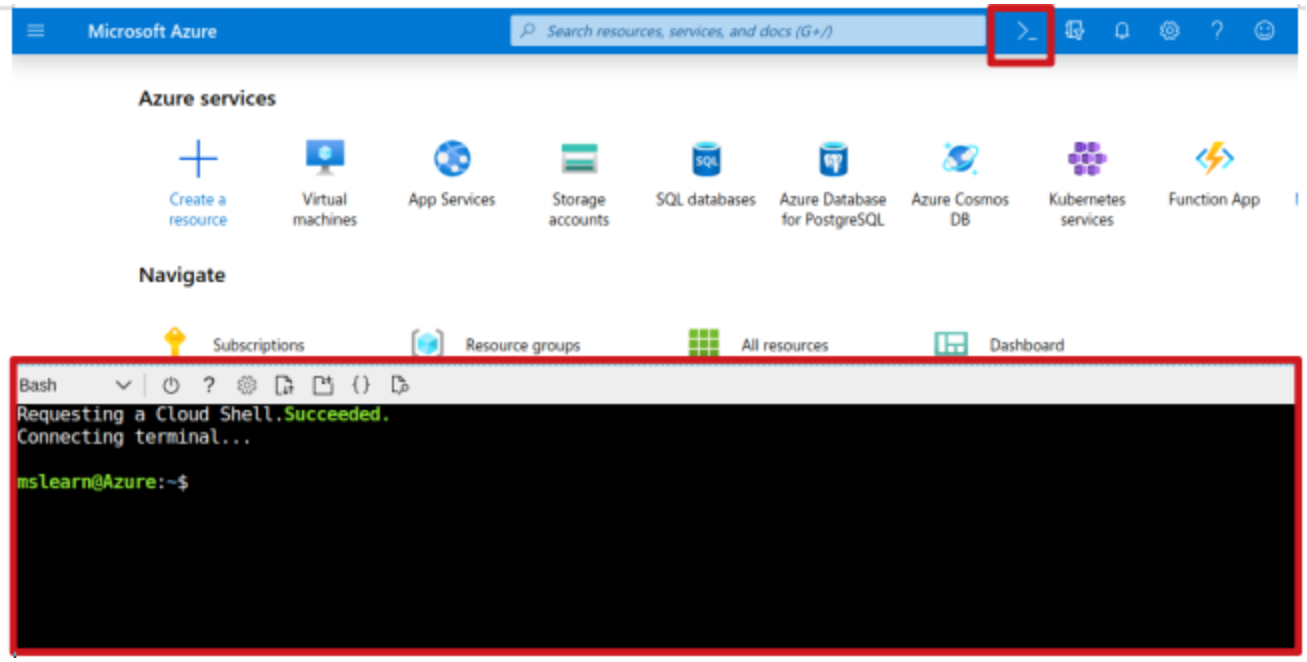
100 XP

Exercise - Set up communication between IoT Hub and IoT Edge

15 minutes

This exercise uses Azure CLI in Azure Cloud Shell to issue the required commands.



Install Azure IoT extension

You need to add the Azure IoT extension to the Cloud Shell instance Azure CLI.

```
az extension add --name azure-iot
```

> **Note**
>
> This article uses the newest version of the Azure IoT extension, called `azure-iot`. The legacy version is called `azure-cli-iot-ext`.You should only have one version installed at a time. To see what extensions you have installed, use `az extension list`.

Use `az extension remove --name azure-cli-iot-ext` to remove the legacy version of the extension.

Use `az extension add --name azure-iot` to add the new version of the extension.

Create a resource group

Create a resource group called "IoTEdgeResources" using the following command:

Azure CLI

```
az group create --name IoTEdgeResources --location eastus2
```

The resulting output should be similar to this:

```
mslearn@Azure:~$ az group create --name IoTEdgeResources --location eastus2
{
  "id": "/subscriptions/efec5dd3-fc83-4702-98df-8f9934e410c3/resourceGroups/IoTEdgeResources",
  "location": "eastus2",
  "managedBy": null,
  "name": "IoTEdgeResources",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
```

Create an IoT hub

The following code creates a free **F1 tier** hub in the resource group "IoTEdgeResources". Replace `{hub_name}` with a unique name for your IoT Hub.

Azure CLI

```
az iot hub create --resource-group IoTEdgeResources --name {hub_name} --sku F1 --partition-count 2
```

Note

If you get an error because there's already one free hub in your subscription, change the SKU to **S1**. Each subscription can only have one free IoT hub. If you get an error that the IoT hub

name isn't available, it means that someone else already has a hub with that name.

Register an IoT Edge device

In the Azure Cloud Shell, use the following instructions to create a device named "myEdgeDevice" in your hub.

Create a device identity

Since IoT Edge devices behave and can be managed differently compared to typical IoT devices, declare this identity to be for an IoT Edge device with the `--edge-enabled` flag.

> **ⓘ Important**
>
> If you get an error about "iothubowner policy keys", make sure that your Cloud Shell is running the latest version of the `azure-iot` extension.

The following command creates the device identity:

Azure CLI

```
az iot hub device-identity create --hub-name {hub_name} --device-id myEdgeDevice --edge-enabled
```

```
mslearn@Azure:~$ az iot hub device-identity create --hub-name hubmslearn --device-id myEdgeDevice --edge-enabled
{
  "authentication": {
    "symmetricKey": {
      "primaryKey": "nK8ZF7rAlGB7n00Mg1jBAWz0VxORnW+dSCv8jrHk6eQ=",
      "secondaryKey": "OKHAaZ+MnPUZGPPSOLLb76gZzoiSog9+0qaeKtfDqHw="
    },
    "type": "sas",
    "x509Thumbprint": {
      "primaryThumbprint": null,
      "secondaryThumbprint": null
    }
  },
  "capabilities": {
    "iotEdge": true
  },
  "cloudToDeviceMessageCount": 0,
  "connectionState": "Disconnected",
  "connectionStateUpdatedTime": "0001-01-01T00:00:00",
  "deviceId": "myEdgeDevice",
  "deviceScope": "ms-azure-iot-edge://myEdgeDevice-637110687233744298",
  "etag": "MTE0OTE5NDY2",
  "generationId": "637110687233744298",
  "lastActivityTime": "0001-01-01T00:00:00",
  "status": "enabled",
  "statusReason": null,
  "statusUpdatedTime": "0001-01-01T00:00:00"
}
```

Retrieve the connection string

To retrieve the connection string for your device, which links your physical device with its identity in IoT Hub, use this command:

Azure CLI

```
az iot hub device-identity connection-string show --device-id myEdgeDevice --hub-name {hub_name} --output table
```

The resulting output should be similar to this:

```
HostName={YourIoTHubName}.azure-devices.net;DeviceId=MyNodeDevice;SharedAccessKey={YourSharedAccessKey}
```

Copy the value of the `connectionString` key from the JSON output and save it. This value is the **device connection string**. You use this to configure the IoT Edge runtime in the next section.

Deploy the IoT Edge device

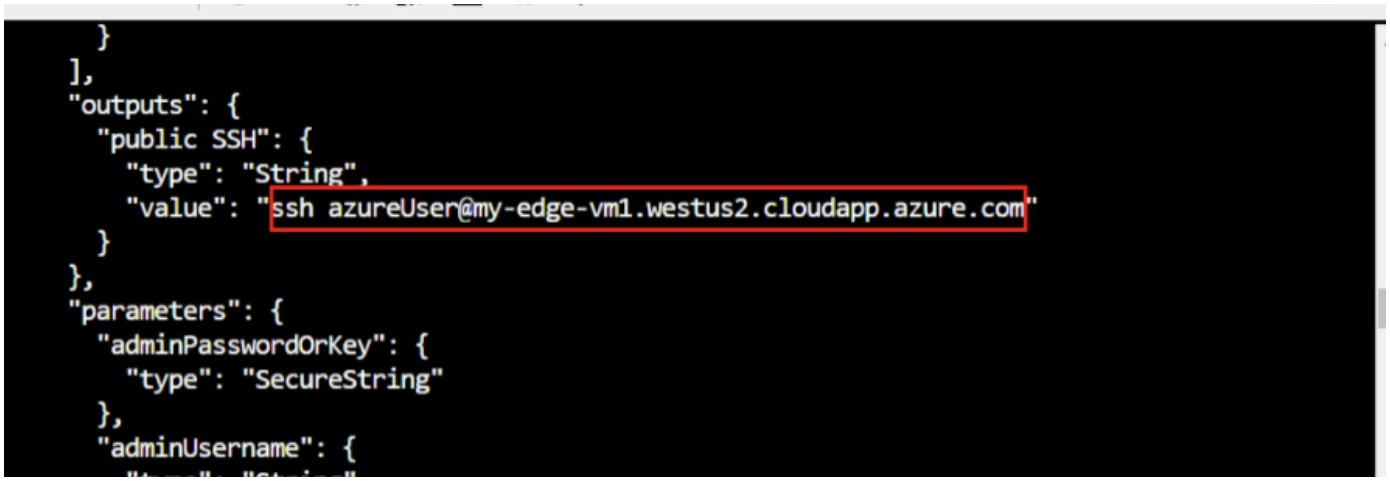
Use the following CLI command to create your IoT Edge device based on the prebuilt iotedge-vm-deploy template. Copy the following command into a text editor, replace the placeholder text with your information, then copy into your bash or Cloud Shell window:

Azure CLI

```
az deployment group create \
--resource-group IoTEdgeResources \
--template-uri "https://aka.ms/iotedge-vm-deploy" \
--parameters dnsLabelPrefix='<REPLACE_WITH_VM_NAME>' \
--parameters adminUsername='azureuser' \
--parameters deviceConnectionString=$(az iot hub device-identity connection-string
show --device-id myEdgeDevice --hub-name
<REPLACE_WITH_HUB_NAME> -o tsv) \
--parameters authenticationType='password' \
--parameters adminPasswordOrKey="<REPLACE_WITH_PASSWORD>"
```

Make sure that your password(**adminPasswordOrKey**) must be at least 12 characters long and have three of four of the following: lowercase characters, uppercase characters, digits, and special characters.

It may take a few minutes to create and start the new virtual machine. Once the deployment is complete, you should receive JSON-formatted output in the CLI that contains the SSH information to connect to the virtual machine. Copy the value of the **public SSH** entry of the **outputs** section:



View the IoT Edge runtime status

Use the following command to connect to your virtual machine. Replace `azureuser` if you used a different username than the one suggested during the deployment of the VM. Replace `{DNS name}` with your machine's DNS name.

Bash

```
ssh {admin username}@{DNS name}
```

Check if the IoT Edge device is configured

To verify that the IoT Edge security daemon is running as a system service, we use `iotedge` commands.

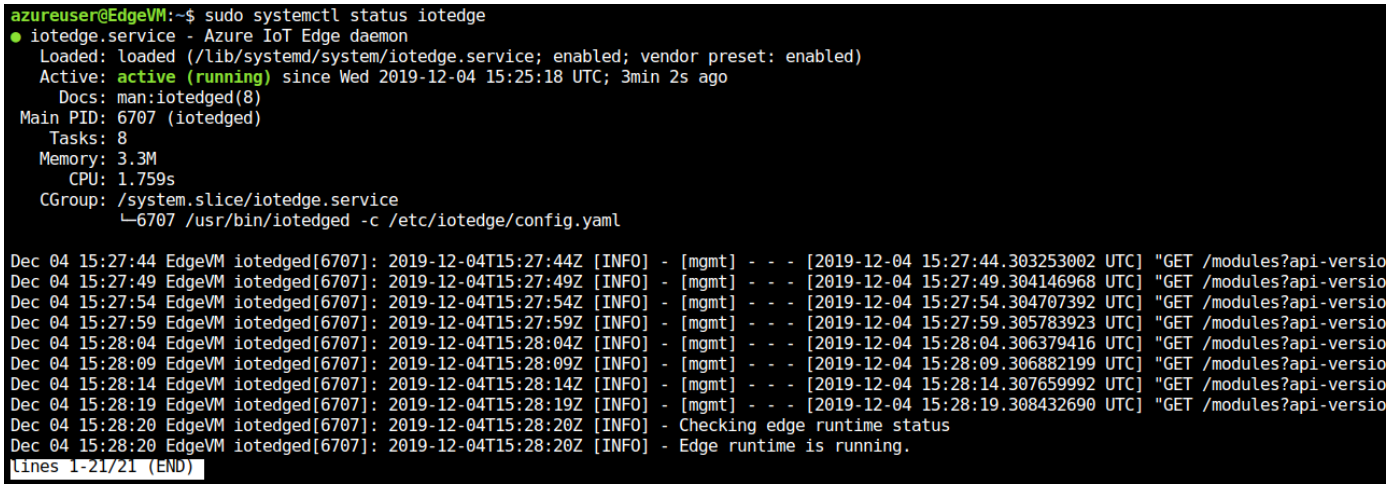
> **Important**
>
> You need elevated privileges to run iotedge commands.

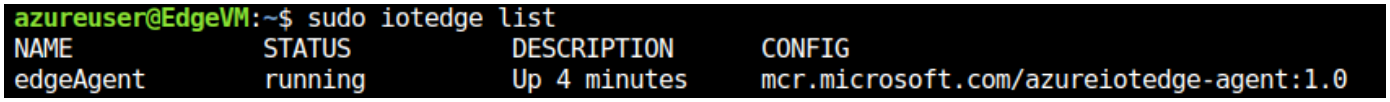
Run the following commands to test the status of the IoT Edge device:

Bash

```
sudo systemctl status iotedge
```

The resulting output should be similar to this:





Your IoT Edge device is now configured. It's ready to run cloud-deployed modules.

If you need to troubleshoot the service, retrieve the service logs.

Bash

```
journalctl -u iotedge
```

View all the modules running on your IoT Edge device. Since the service just started for the first time, you should only see the **edgeAgent** module running. The edgeAgent module runs by default and helps to install and start any additional modules that you deploy to your device.

Bash

```
sudo iotedge list
```

Next unit: Deploy a prebuilt module to an IoT Edge device

Continue >