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Using the Hello World guide, you'll start a branch, write comments, and open a pull request.

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mpram structure update

🕒 History

👤 1 contributor

Raw

Blame



289 lines (155 sloc) | 17.7 KB



Microsoft Cloud Workshop

Internet of Things

Before the hands-on lab setup guide

June 2020

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Internet of Things before the hands-on lab setup guide

Requirements

- Microsoft Azure subscription must be pay-as-you-go or MSDN.
 - Trial subscriptions will not work.
- A virtual machine configured with:
 - Visual Studio Community 2019 or later
 - Azure SDK 2.9 or later (Included with Visual Studio)
- A running Azure Databricks cluster.
- A work email address that has Power BI enabled, allowing you to create a Power BI account if one does not exist.

Before the hands-on lab

Duration: 45 minutes

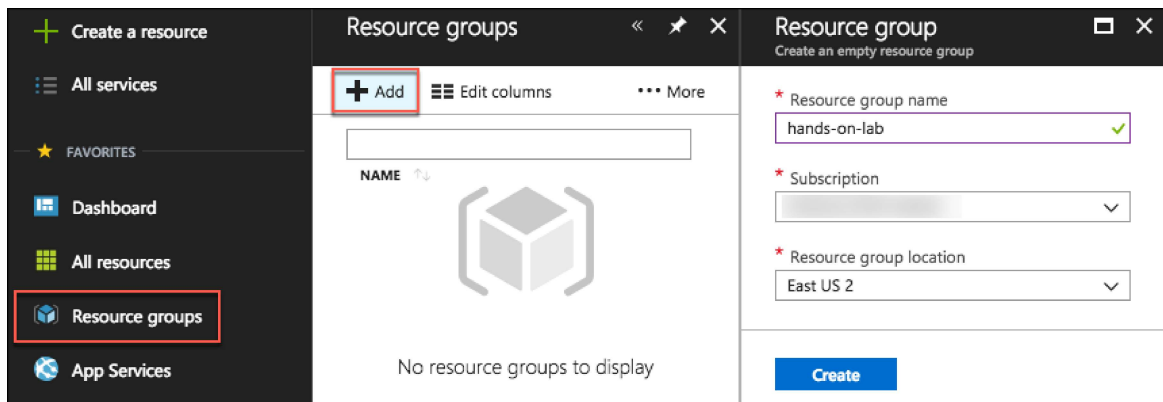
In the Before the hands-on lab exercise, you will set up your environment for use in the rest of the hands-on lab. You should follow all the steps provided in the Before the hands-on lab section to prepare your environment **before attending** the hands-on lab. Failure to do so will significantly impact your ability to complete the lab within the time allowed.

IMPORTANT: Most Azure resources require unique names. Throughout this lab you will see the word "SUFFIX" as part of resource names. You should replace this with your Microsoft alias, initials, or another value to ensure the resource is uniquely named.

Task 1: Provision a resource group

In this task, you will create an Azure resource group for the resources used throughout this lab.

1. In the [Azure portal](#), select **Resource groups**, select **+Add**, then enter the following in the **Create an empty resource group** blade:
 - **Name:** Enter `hands-on-lab-SUFFIX`
 - **Subscription:** Select the subscription you are using for this hands-on lab.
 - **Resource group location:** Select the region you would like to use for resources in this hands-on lab. Remember this location so you can use it for the other resources you'll provision throughout this lab.



- Select **Create**.

Task 2: Setup a lab virtual machine

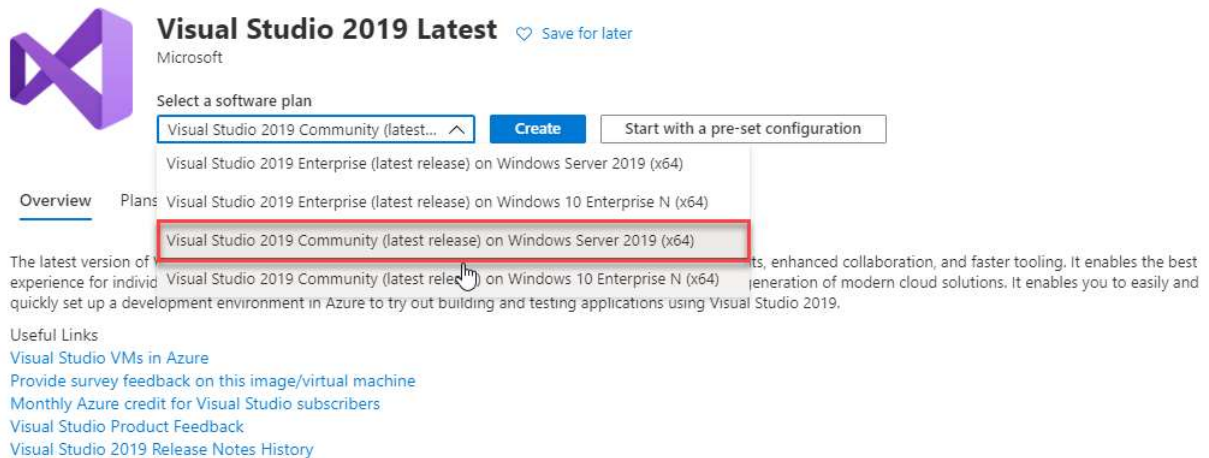
In this task, you will provision a virtual machine running Visual Studio Community 2019 that you will use as your development machine for this hands-on lab.

Note: Your Azure subscription must have MSDN offers associated with it to provision a new virtual machine with Visual Studio pre-loaded. If your subscription does not meet this requirement, you will need to either create a new VM with the same settings below, but without Visual Studio pre-installed, then install Visual Studio Community 2019, or install it on your own machine.

Optional: If you already have Visual Studio 2019 or greater installed on your machine, you may skip this step.

1. In the [Azure portal](#), select **+Create a resource**
2. In the **Search the marketplace** textbox, enter `Visual Studio 2019 Latest` and then select it from the suggested options.
3. For the **Select a software plan**, select **Visual Studio 2019 Enterprise on Windows Server 2019 (x64)** from the results, and select **Create**.

Visual Studio 2019 Latest ✕
Microsoft



4. Set the following configuration on the **Basics** tab:

- **Subscription:** Select the same subscription you are using for this hands-on lab.
- **Resource Group:** Select Use existing and select the **hands-on-lab-SUFFIX** resource group.
- **Virtual machine name:** Enter `LabVM`
- **Region:** Select the same region you selected for the resource group.
- **Availability options:** Select **No infrastructure redundancy required**.
- **Image:** The Visual Studio Community image you selected in the previous step should be listed here.
- **Size:** Select the **Standard D2 v3** size if it is not already selected.
- **Username:** Enter `demouser`
- **Password:** Enter a password that you will remember.

- **Public inbound ports:** Select **Allow selected ports**.
- **Selected inbound ports:** Select **RDP (3389)** from the drop down.

Create a virtual machine

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 * ⓘ ▼

[Browse all public and private images](#)

Azure Spot instance ⓘ ☐ Yes ☒ No

Size * ⓘ ▼

[Select size](#)

Administrator account

Username * ⓘ ✓

Password * ⓘ ✓

Confirm password * ⓘ ✓

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

Select inbound ports * ▼

⚠ 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.

Save money

Already have a Windows license? * ⓘ ☐ Yes ☒ No

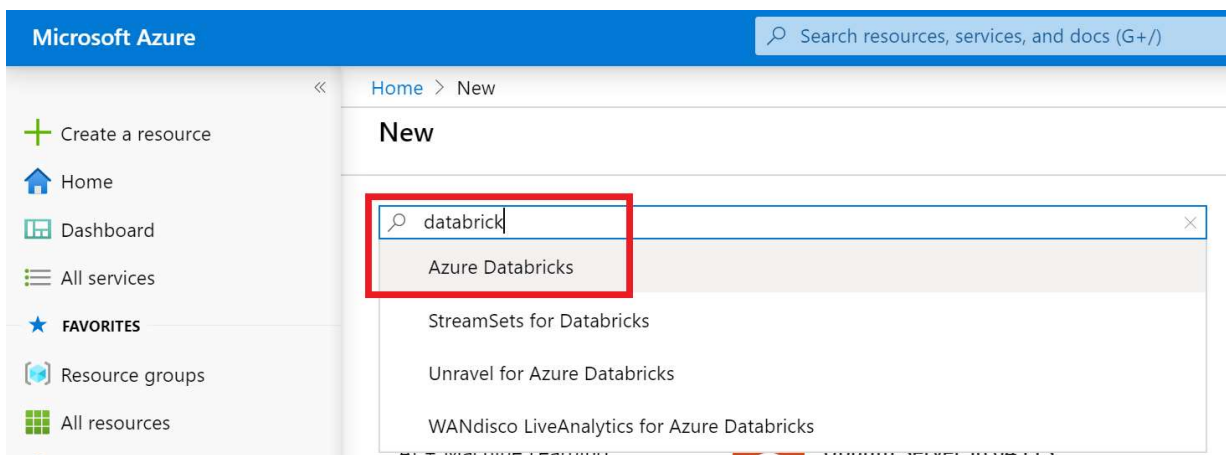
- **License Type:** Select **Windows Server** from the drop down.

- Go to the **Management** tab in **Monitoring** section click on **Disable** for **Boot Diagnostics**
 - Select **Review + create** to move to the next step.
5. Select **Create** on the Create blade to provision the virtual machine.
 6. It may take 10+ minutes for the virtual machine to complete provisioning.
 7. You can move on to the next task while waiting for the lab VM to provision.

Task 3: Provision Azure Databricks

In this task, you will create an Azure Databricks workspace.

1. In the [Azure portal](#), select **+Create a resource**, then enter `databricks` into the **Search the Marketplace** box.
2. Select **Azure Databricks** from the results, and then select **Create**.



3. On the **Azure Databricks Service** blade, enter the following:
 - **Workspace name:** Enter `iot-db-workspace-SUFFIX`
 - **Subscription:** Select the subscription you are using for this hands-on lab.
 - **Resource group:** Choose Use existing and select the `hands-on-lab-SUFFIX` resource group.
 - **Location:** Select the location you are using for resources in this hands-on lab.
 - **Pricing tier:** Select **Standard**

Azure Databricks Service

* Basics Networking Tags Review + Create

Project Details

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

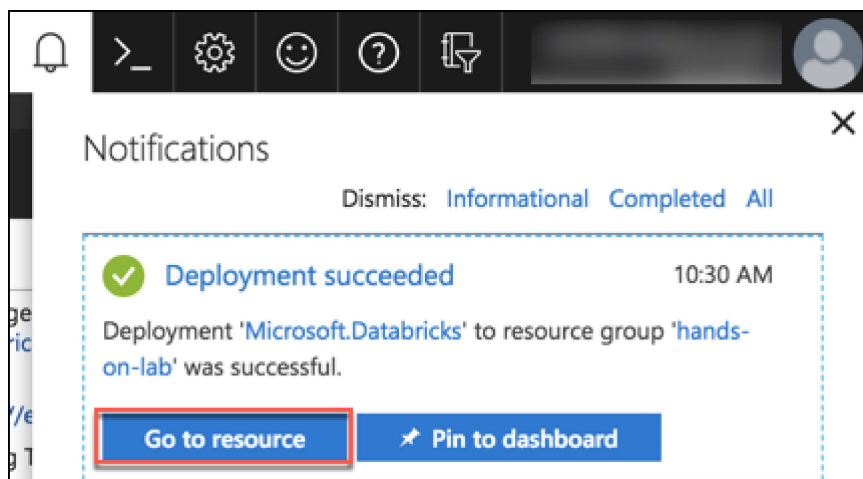
Subscription *	Demo Creation
Resource group *	LinoloTMCW
	Create new
Instance Details	
Workspace name *	iot-db-workspace
Location *	East US
Pricing Tier *	Standard (Apache Spark, Secure with Azure AD)

- o Select **Review + Create**.
- o Select **Create**.

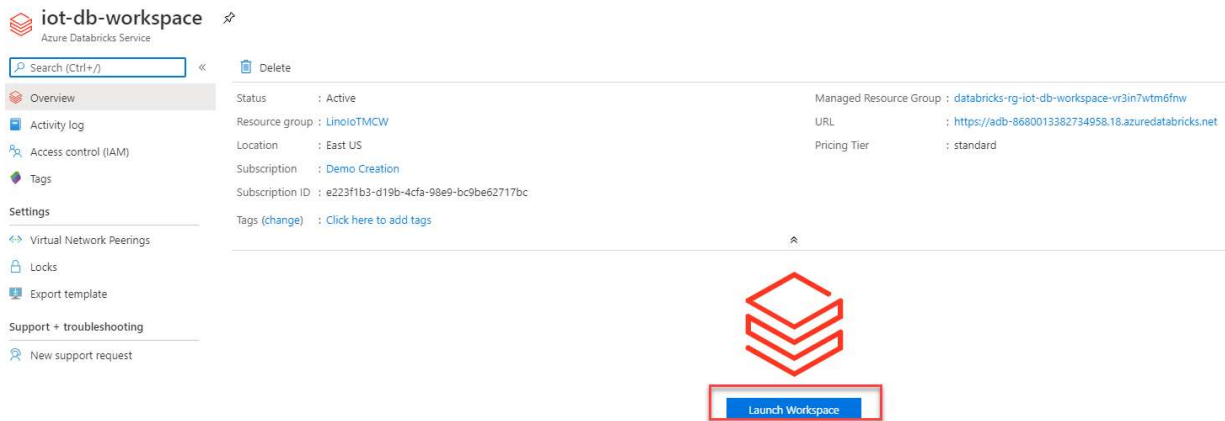
Task 4: Create Databricks cluster

In this task, you will create an Azure Databricks cluster within the workspace you created previously.

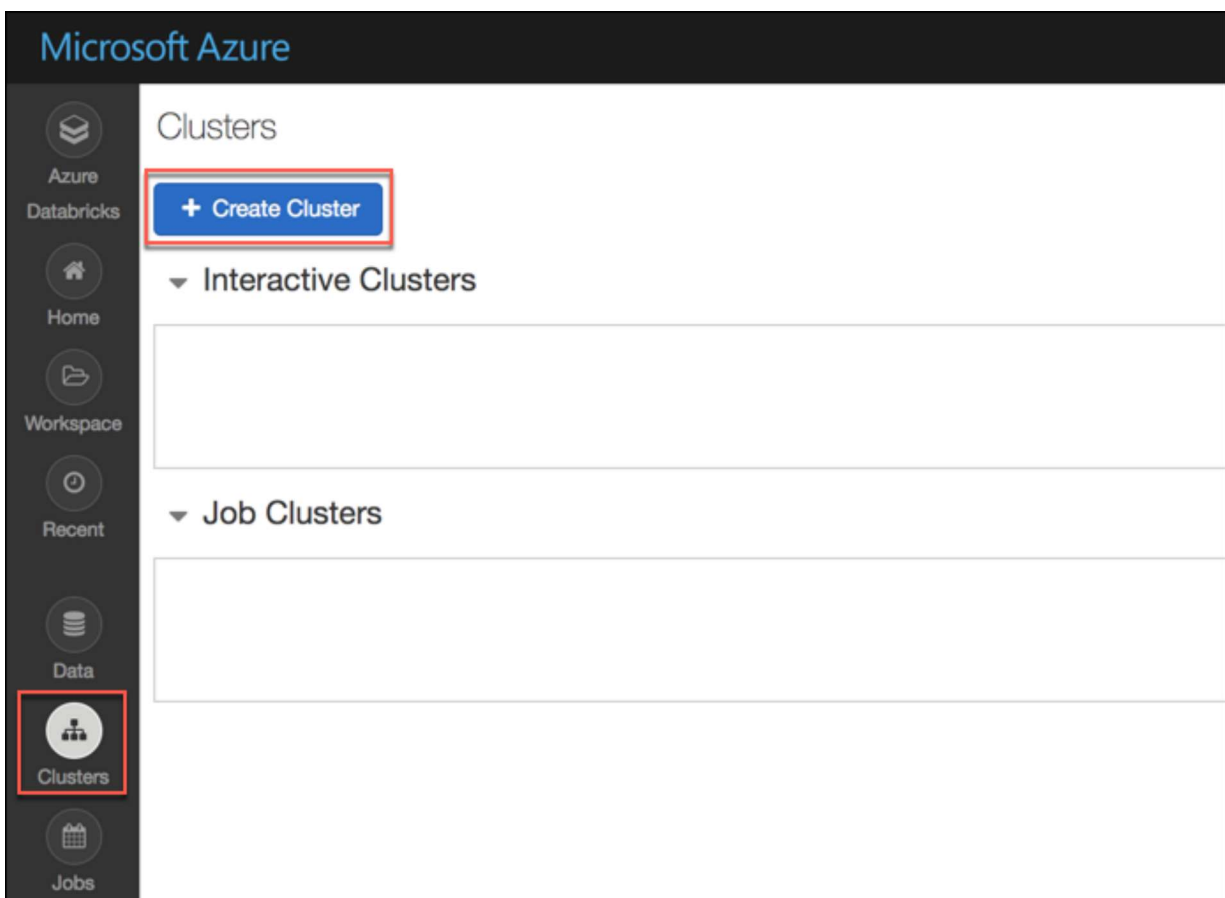
1. Once the deployment of the Databricks workspace is complete, select **Go to resource** on the notification you receive.



2. On the **Azure Databricks Service** overview blade, select **Launch Workspace**.



3. In the new browser window that opens, select **Clusters** from the left-hand navigation menu, then select **+Create Cluster**.



4. On the **Create Cluster** page, enter `iot-cluster-SUFFIX` for the **Cluster Name**, leave the remaining values to their defaults, and select **Create Cluster**.

Microsoft Azure

Azure Databricks

Create Cluster

New Cluster

Cancel Create Cluster

2-8 Workers: 28.0-112.0 GB Memory, 8-32 Cores, 1.5-6 DBU
1 Driver: 14.0 GB Memory, 4 Cores, 0.75 DBU

Cluster Name
iot-cluster

Cluster Mode
Standard

Pool
None

Databricks Runtime Version
Runtime: 6.5 (Scala 2.11, Spark 2.4.5)

New This Runtime version supports only Python 3.

Autopilot Options

☒ Enable autoscaling

☒ Terminate after 120 minutes of inactivity

Worker Type
Standard_DS3_v2 14.0 GB Memory, 4 Cores, 0.75 DBU

Min Workers 2 Max Workers 8

Driver Type
Same as worker 14.0 GB Memory, 4 Cores, 0.75 DBU

Advanced Options

5. After a few minutes, your cluster will display as running.

Interactive Clusters

Name	State	Nodes	Driver	Worker	Runtime
iot-cluster	Running	3	Standard_...	Standard_D.	5.5 LTS (inclu.

Task 5: Provision Power BI

If you do not already have a Power BI account:

1. Go to <https://powerbi.microsoft.com/features/>.
2. Scroll down until you see the **Try Power BI for free!** section of the page and select the **Try Free** button.

Try Power BI Pro for free!

Get started with a free 60-day trial of Power BI Pro. You'll be able to share and distribute reports without any complicated setup.

TRY FREE >

- On the page, enter your work email address (which should be the same account as the one you use for your Azure subscription), and select **Sign up**.

Get started

Sign up ➔

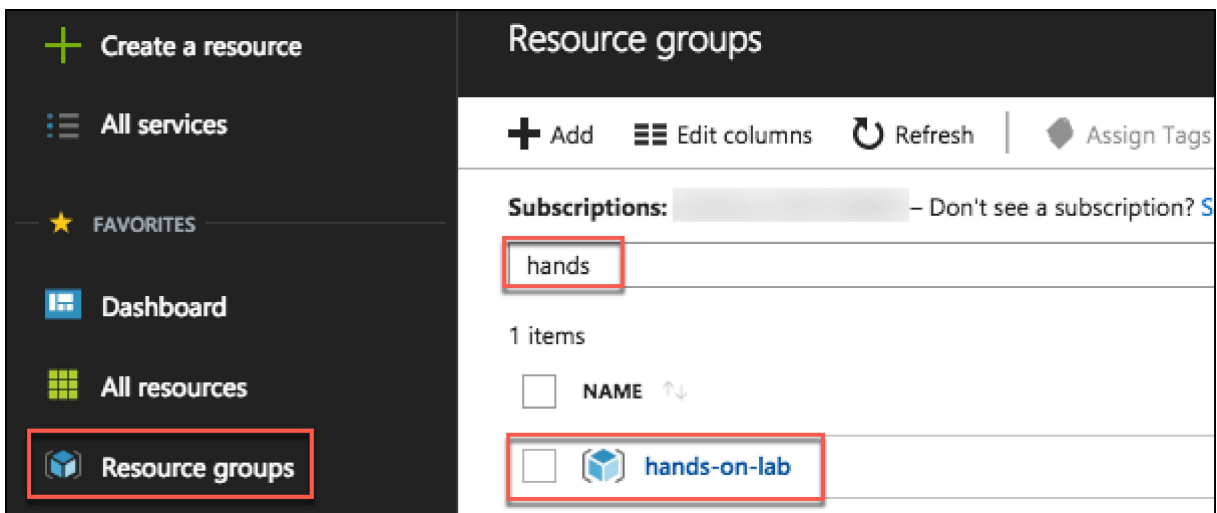
- Follow the on-screen prompts, and your Power BI environment should be ready within minutes.

Note: You can always return to your Power BI environment by navigating to <https://app.powerbi.com/>.





















Task 6: Connect to your Lab VM

In this task, you will create an RDP connection to your lab virtual machine (VM).









- In the [Azure portal](#), select **Resource groups** in the Azure navigation pane, enter your resource group name `hands-on-lab-SUFFIX` into the filter box, and select it from the list.



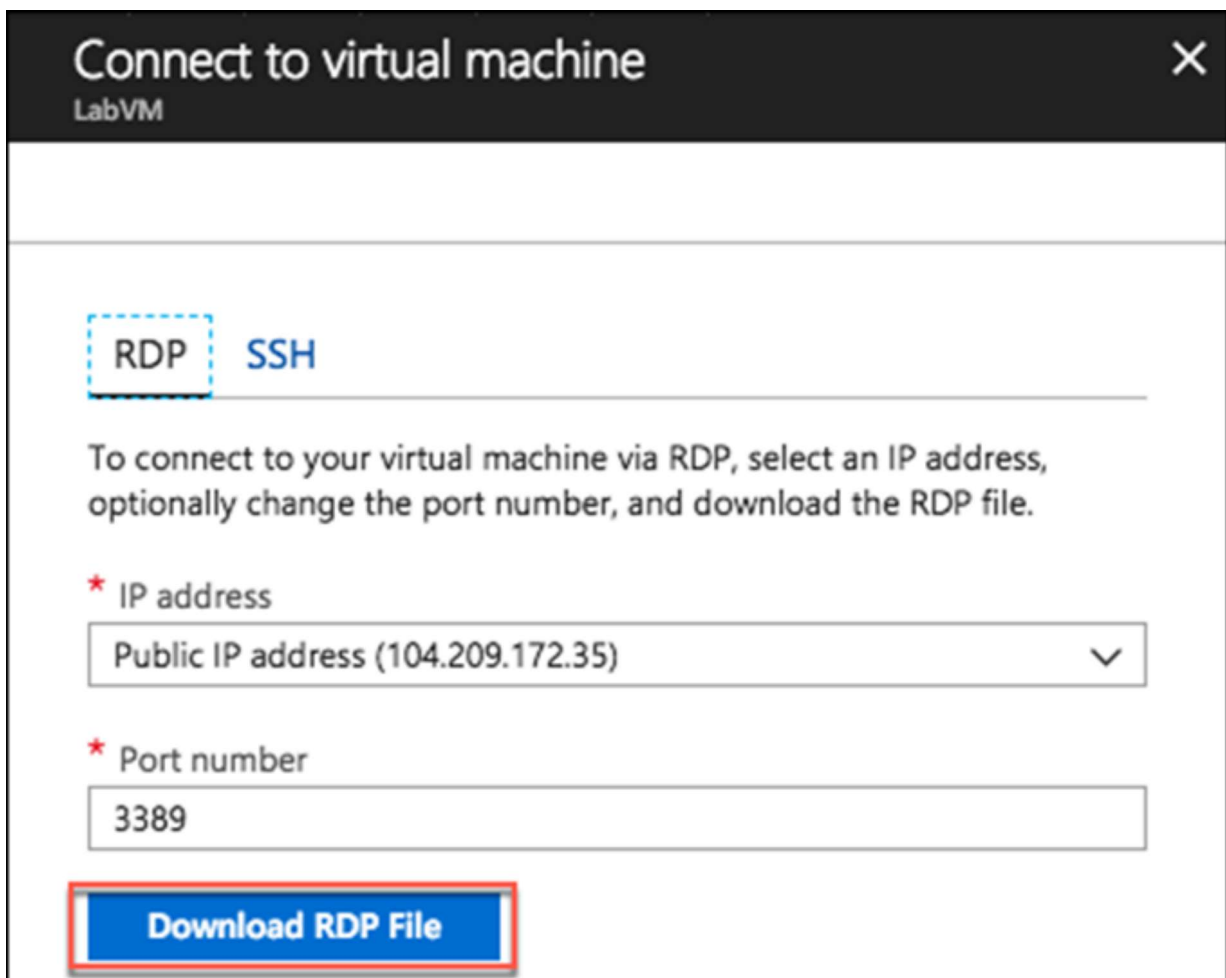
2. In the list of resources for your resource group, select the **LabVM** virtual machine.

<input type="checkbox"/>	NAME 	TYPE 	LOCATION 	
<input type="checkbox"/>	 handsonlabdiag	Storage account	East US 2	...
<input type="checkbox"/>	 handsonlabmldiag	Storage account	East US 2	...
<input type="checkbox"/>	 hands-on-lab-vnet	Virtual network	East US 2	...
<input type="checkbox"/>	 LabMLServer	Virtual machine	East US 2	...
<input type="checkbox"/>	 LabMLServer_OsDisk_1_6d6e8bcc358649b7a04b9ee5c1f24ef1	Disk	East US 2	...
<input type="checkbox"/>	 LabMLServer-ip	Public IP address	East US 2	...
<input type="checkbox"/>	 labmlservernic	Network interface	East US 2	...
<input type="checkbox"/>	 LabMLServer-nsg	Network security group	East US 2	...
<input type="checkbox"/>	 labstoragekab	Storage account	East US 2	...
<input type="checkbox"/>	 LabVM	Virtual machine	East US 2	...
<input type="checkbox"/>	 config-labvm (LabVM/config-labvm)	Microsoft.Compute/virtualMachines/extension...	East US 2	...
<input type="checkbox"/>	 LabVM_OsDisk_1_72efbe8172324e38b73b0b5628ae57fe	Disk	East US 2	...
<input type="checkbox"/>	 LabVM-ip	Public IP address	East US 2	...
<input type="checkbox"/>	 labvmnic	Network interface	East US 2	...
<input type="checkbox"/>	 LabVM-nsg	Network security group	East US 2	...
<input type="checkbox"/>	 photostoragekab	Storage account	East US 2	...
<input type="checkbox"/>	 rclusterkab	HDInsight cluster	East US 2	...

3. On your **LabVM** blade, select **Connect** from the top menu.

 Connect	 Start	 Restart	 Stop	 Capture	 Move	 Delete	 Refresh
Resource group (change) hands-on-lab	Computer name LabVM						
Status Running	Operating system Windows						
Location East US 2	Size Standard D2s v3 (2 vcpus, 8 GB memory)						
Subscription (change)	Public IP address 52.179.195.28						

4. Select **Download RDP file**, then open the downloaded RDP file.



The image shows a 'Connect to virtual machine' dialog box from 'LabVM'. It has a dark header bar with the title and a close button. Below the header, there are two tabs: 'RDP' (selected) and 'SSH'. A text block explains that to connect via RDP, one must select an IP address, optionally change the port number, and download the RDP file. There are two required fields: 'IP address' with a dropdown menu showing 'Public IP address (104.209.172.35)' and 'Port number' with a text input field containing '3389'. At the bottom, there is a blue button labeled 'Download RDP File'.

Connect to virtual machine
LabVM

RDP SSH

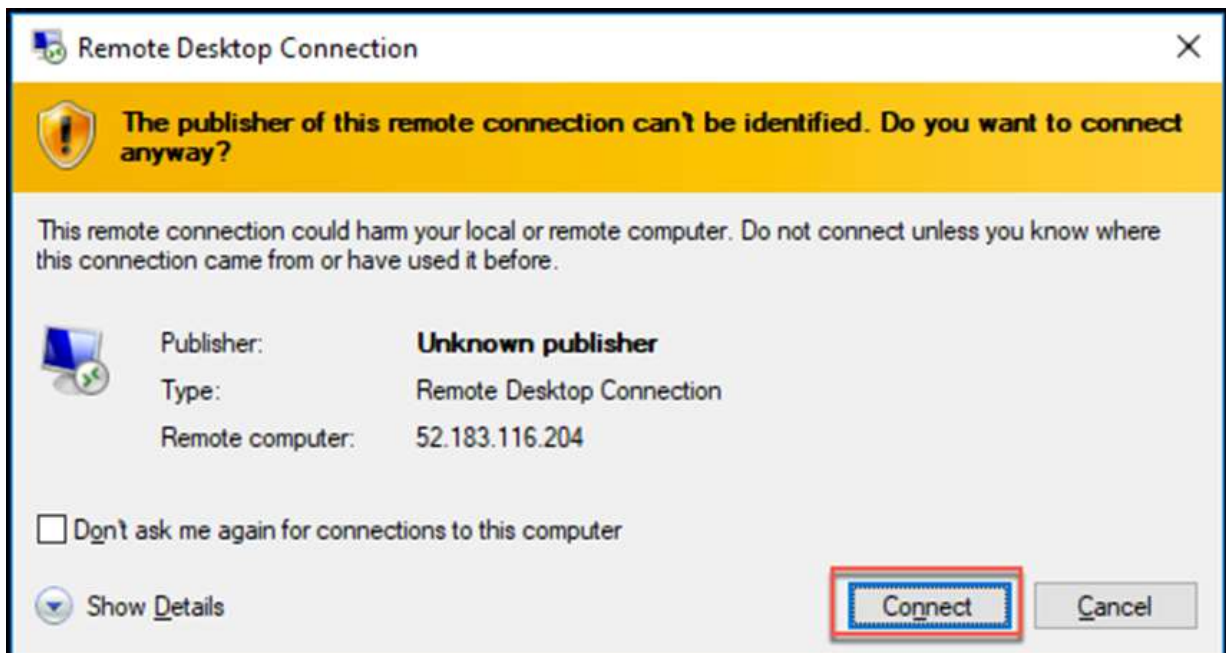
To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.

* IP address
Public IP address (104.209.172.35) ✓

* Port number
3389

Download RDP File

5. Select Connect on the Remote Desktop Connection dialog.




The image shows a 'Remote Desktop Connection' dialog box. It has a yellow warning banner at the top stating 'The publisher of this remote connection can't be identified. Do you want to connect anyway?'. Below the banner, a text block warns that the connection could harm the local or remote computer and advises not to connect unless the user knows where the connection came from or has used it before. There is a small icon of a computer with a green checkmark. Below this, there is a table-like structure showing connection details: 'Publisher: Unknown publisher', 'Type: Remote Desktop Connection', and 'Remote computer: 52.183.116.204'. At the bottom, there is a checkbox labeled 'Don't ask me again for connections to this computer' and a 'Show Details' link. On the right side, there are two buttons: 'Connect' (highlighted with a red box) and 'Cancel'.


Remote Desktop Connection

The publisher of this remote connection can't be identified. Do you want to connect anyway?

This remote connection could harm your local or remote computer. Do not connect unless you know where this connection came from or have used it before.

 Publisher: **Unknown publisher**
Type: Remote Desktop Connection
Remote computer: 52.183.116.204

☐ Don't ask me again for connections to this computer

 Show Details

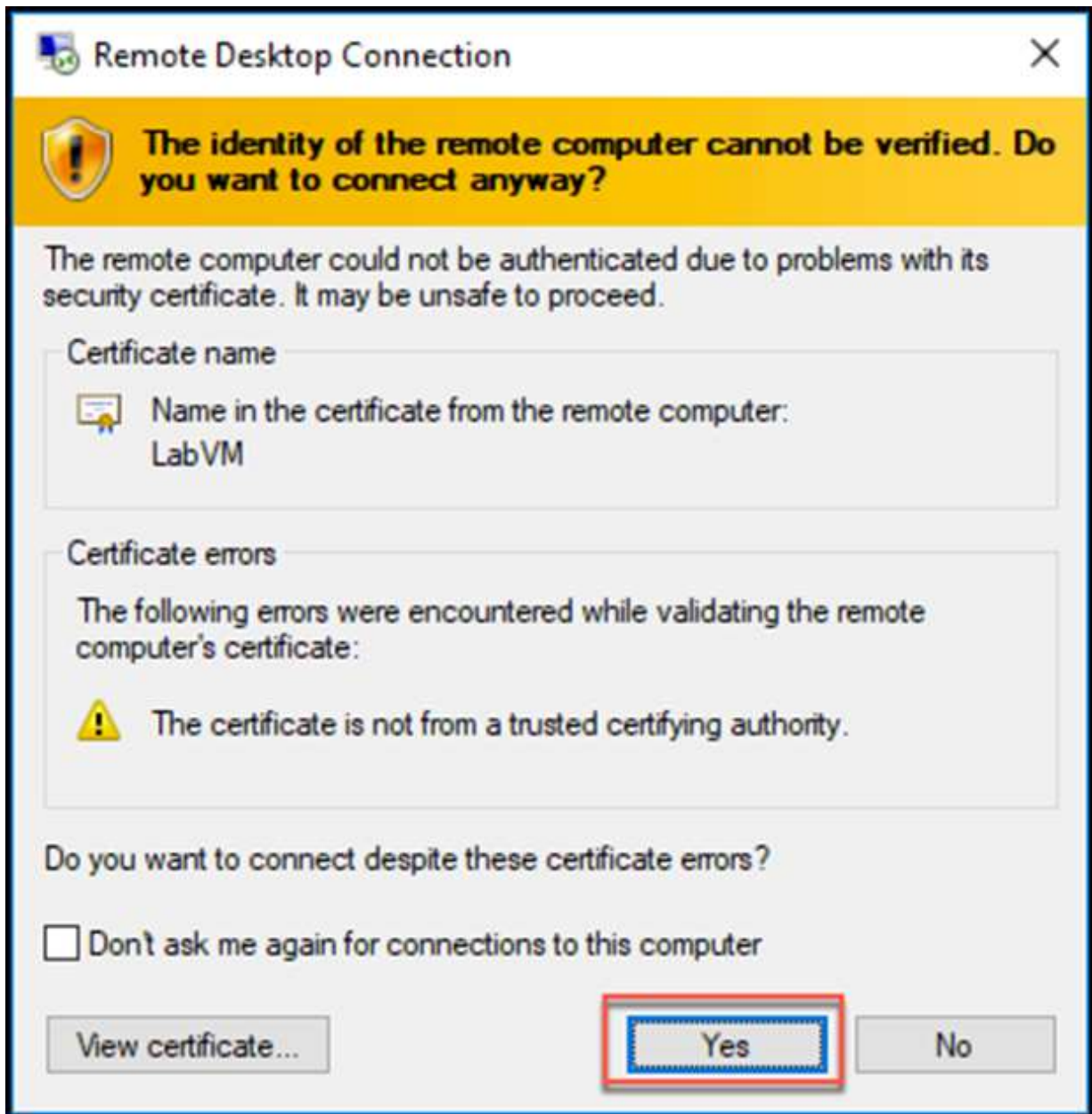
Connect Cancel

6. Enter the following credentials when prompted:

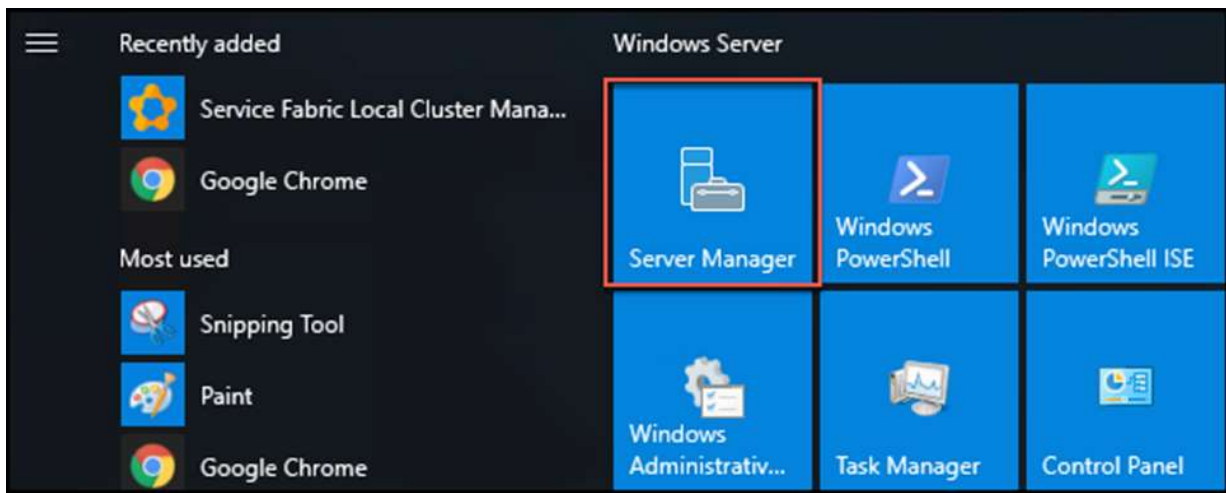
- Username: demouser

- Password: {Your password}

7. Select **Yes** to connect, if prompted that the identity of the remote computer cannot be verified.



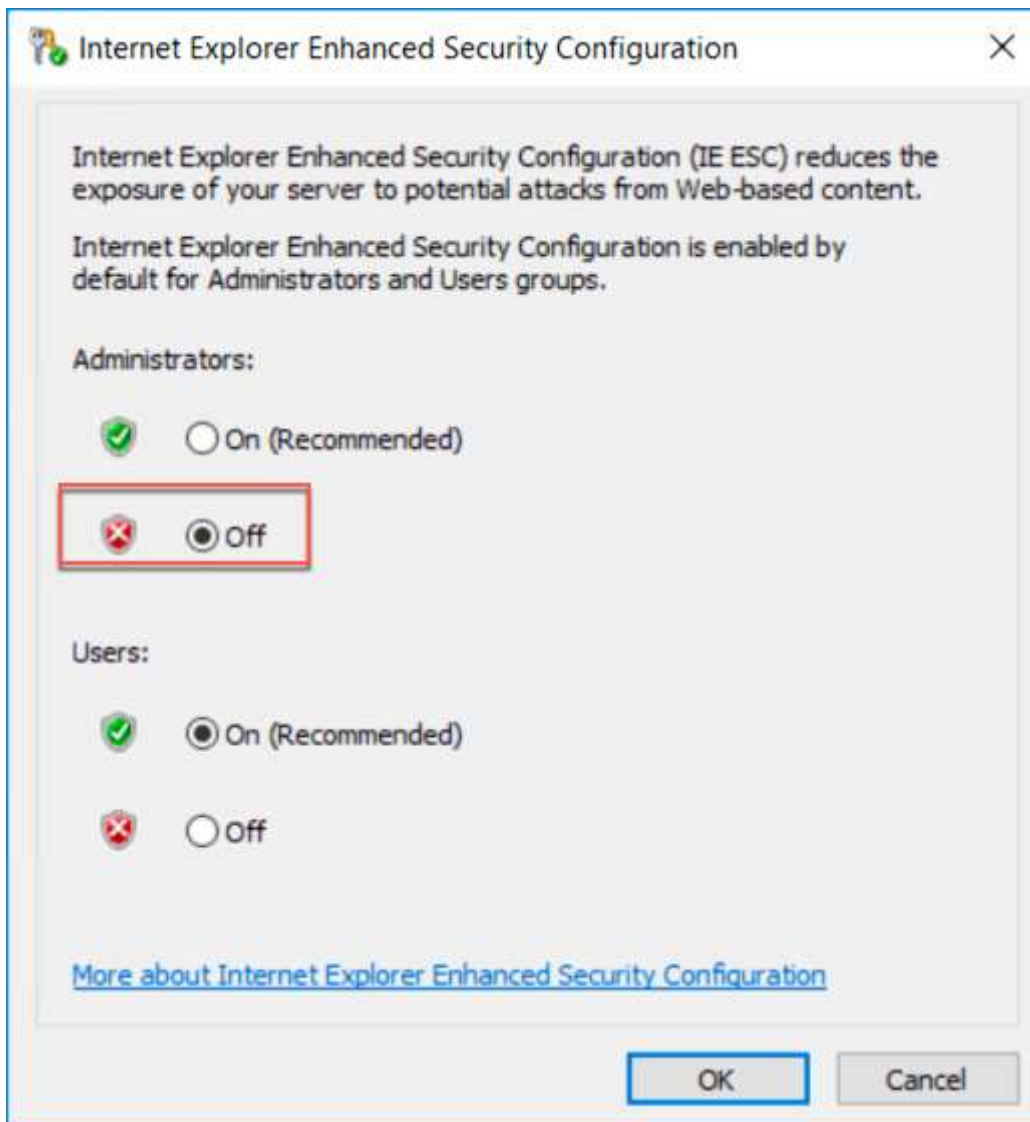
8. Once logged in, launch the **Server Manager**. This should start automatically, but you can access it via the Start menu if it does not start.



9. Select **Local Server**, then select **On** next to **IE Enhanced Security Configuration**. Note: If the link says **off**, skip ahead to the next task.



10. In the **Internet Explorer Enhanced Security Configuration** dialog, select **Off** under **Administrators**, then select **OK**.



11. Close the **Server Manager**.

Task 7: Download Google Chrome

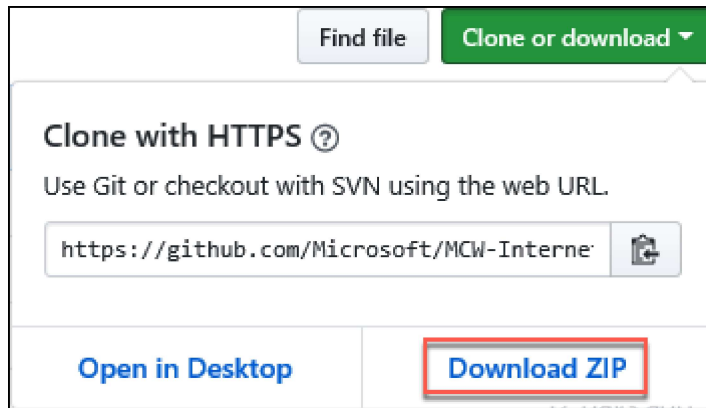
Azure Databricks requires Google Chrome or Firefox. By default, the VM only includes Internet Explorer.

1. From your **LabVM**, open **Internet Explorer** and browse to <https://www.google.com/chrome/>.
2. Select **Download Chrome** on the webpage and follow the prompts.

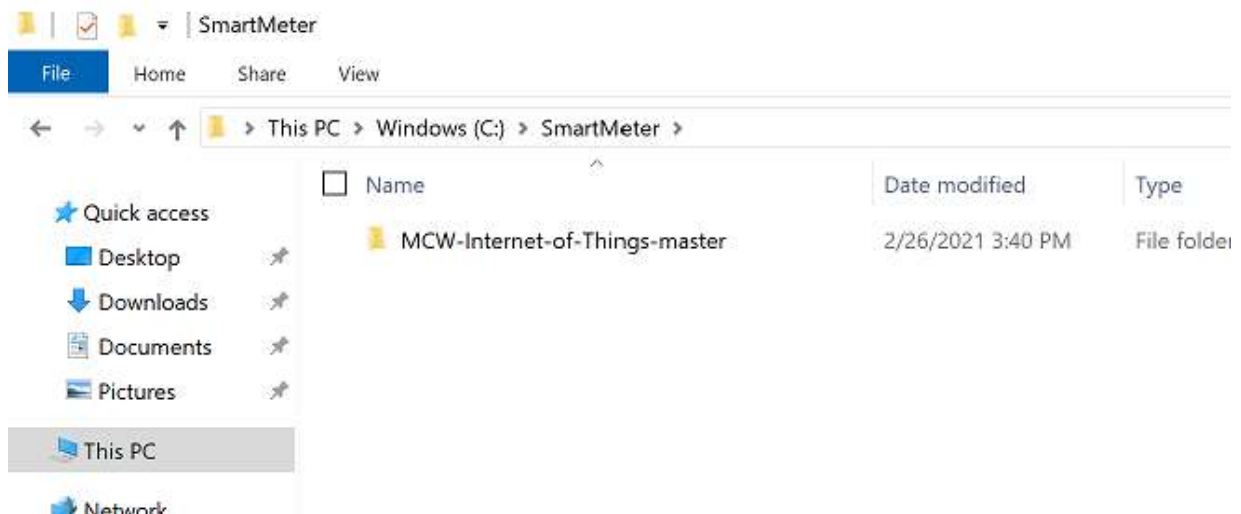
Task 8: Download Smart Meter Simulator project

Fabrikam has provided a Smart Meter Simulator that they use to simulate device registration, as well as the generation and transmission of telemetry data. They have asked you to use this as the starting point for integrating their smart meters with Azure.

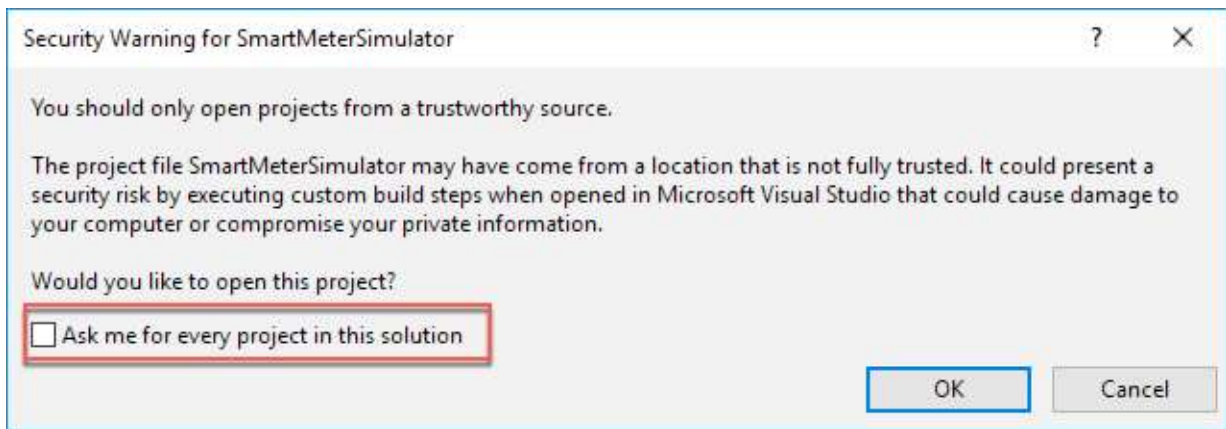
1. From your **LabVM**, download the starter project by downloading a .zip copy of the Internet of Things MCW GitHub repo.
2. In your newly installed Chrome web browser, navigate to the Internet of Things MCW repo: https://github.com/mpram/lot_Academy.
3. On the repo page, select **Clone or download**, then select **Download ZIP**.



4. Right-click the downloaded zip, select the **Unblock** checkbox, select **OK**.
5. Unzip the contents to the folder directly in the **Downloads** Folder, Navigate to ...\\Downloads\\lot_Academy-master\\lot_Academy-master\\Month_1\\Day_2 you will find the folder **MCW-Internet-of-Things-master** copy and paste this folder in a new folder directly in the C drive exactly like this **C:\\SmartMeter**.



6. Navigate to the **SmartMeterSimulator.sln** file within the **Hands-on lab\\lab-files\\starter-project** folder and open it with **Visual Studio 2019**.
7. Sign into Visual Studio or create an account, if prompted.
8. If the Security Warning for SmartMeterSimulator window appears, un-check **Ask me for every project in this solution** and select **OK**.



Note: If you attempt to build the solution at this point, you will see many build errors. This is intentional. You will correct these in the exercises that follow.

You should follow all steps provided *before* performing the Hands-on lab.