

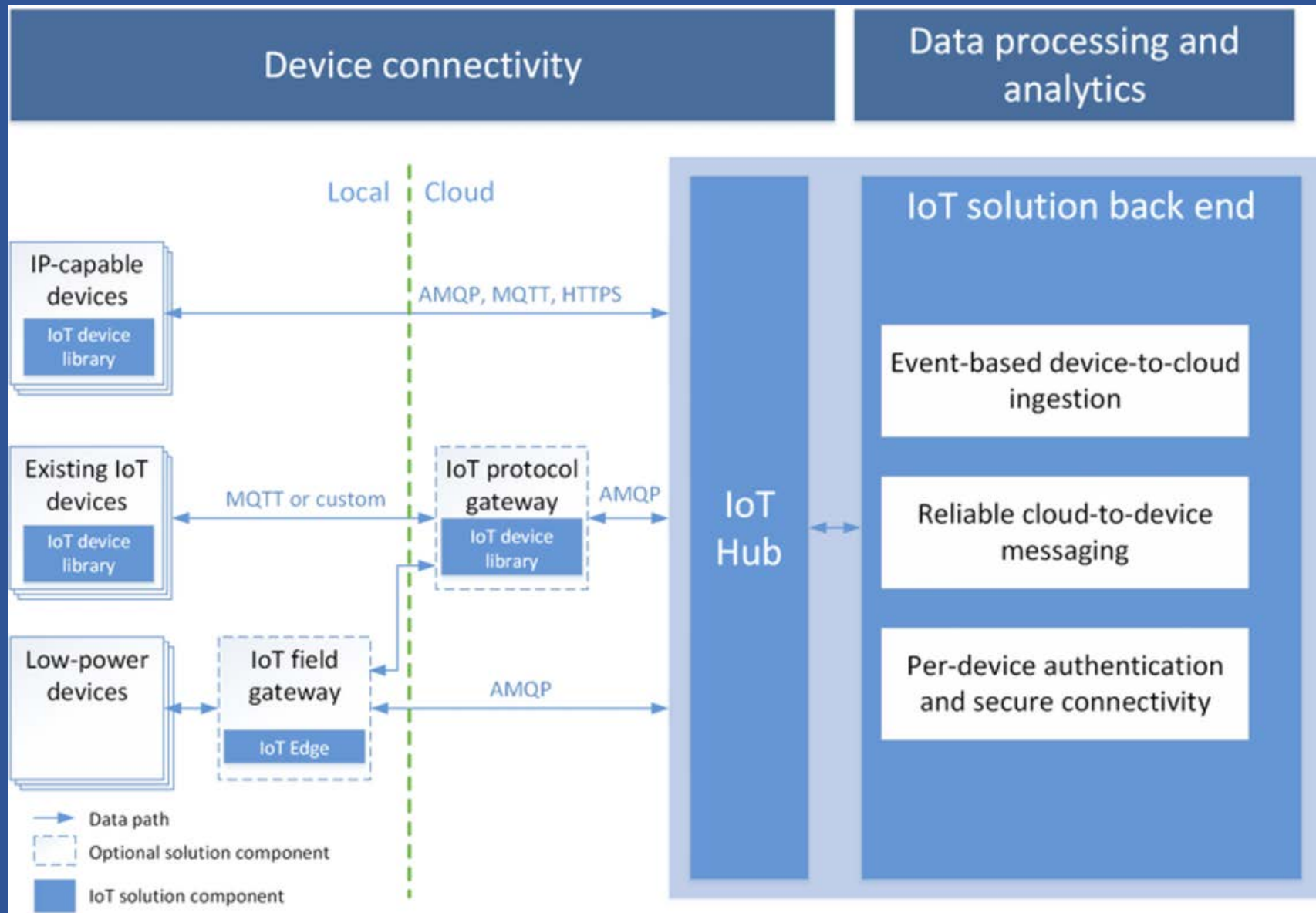
Creating Microsoft Azure IoT hub

In this Session

- Use the Azure portal to create an IoT hub.
- Create a device identity in your IoT hub.
- Create a simulated device that sends telemetry to your cloud back end, and receives commands from your cloud back end.

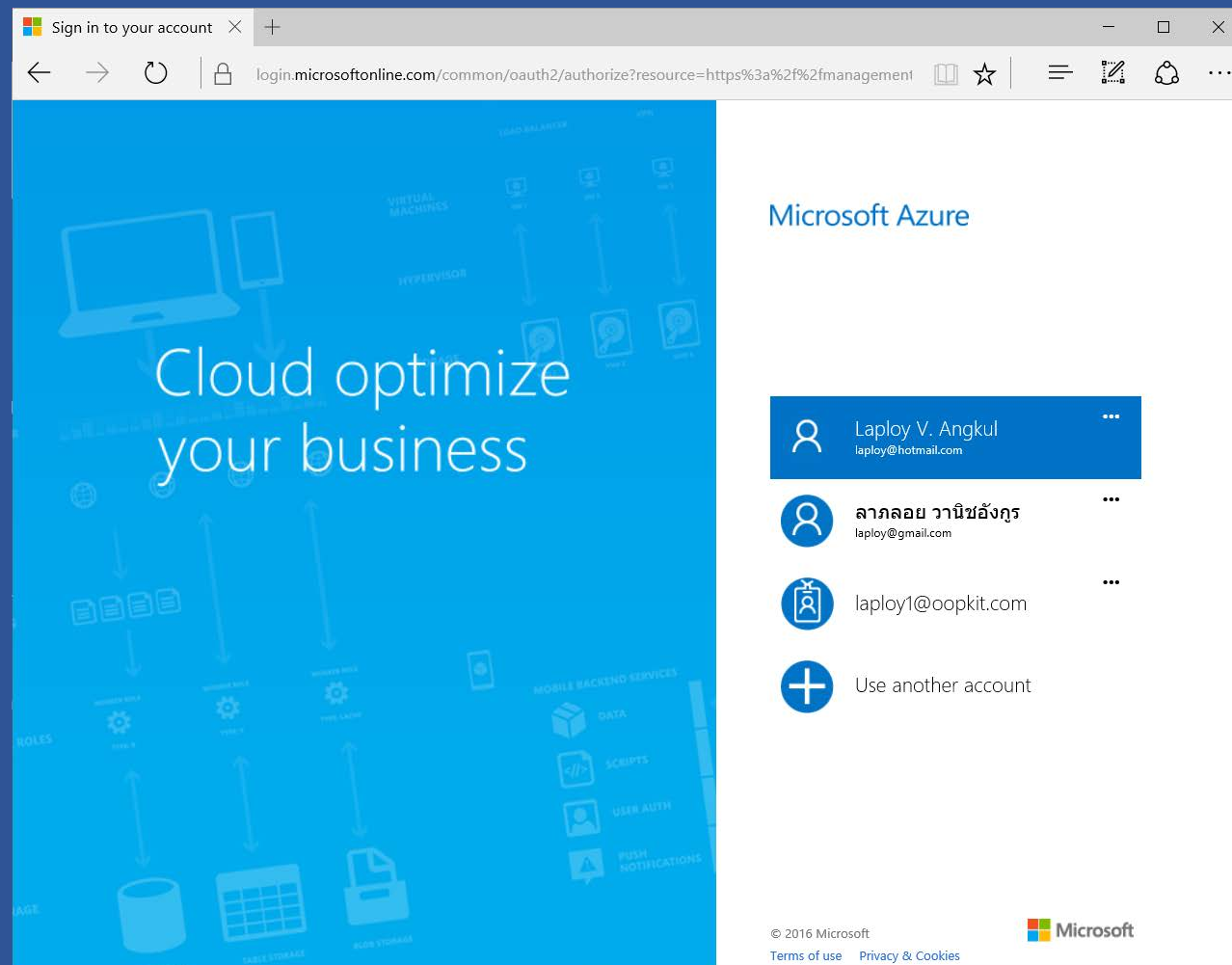
Azure IoT Hub


- is a fully managed service that enables reliable and secure bi-directional communications between millions of Internet of Things (IoT) devices and a solution back.
- Offers reliable device-to-cloud and cloud-to-device hyper-scale messaging.
- Enables secure communications using per-device security credentials and access control.
- Includes device libraries for the most popular languages and platforms.



Create an IoT hub

Go to the Azure portal. <https://portal.azure.com>





Call us overprotective...

...but we need to make sure you can receive a security code if you ever lose access to this account. [Learn more.](#)

Where should we send your code?

☐ Email laploy@gmail.com

☐ I can't verify my account

Next

[Skip for now \(7 days until this is required\)](#)

[I have a code](#)

[Terms of Use](#) [Privacy & Cookies](#) [Sign out](#)

Microsoft

Microsoft account


Security code

Please use the following security code for the Microsoft account [la*****@hotmail.com](#).

Security code: 59379

If you don't recognize the Microsoft account [la*****@hotmail.com](#), you can [click here](#) to remove your email address from that account.

Thanks,
The Microsoft account team



Enter the code

Enter the code we sent to laploy@gmail.com

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Microsoft



Sign in

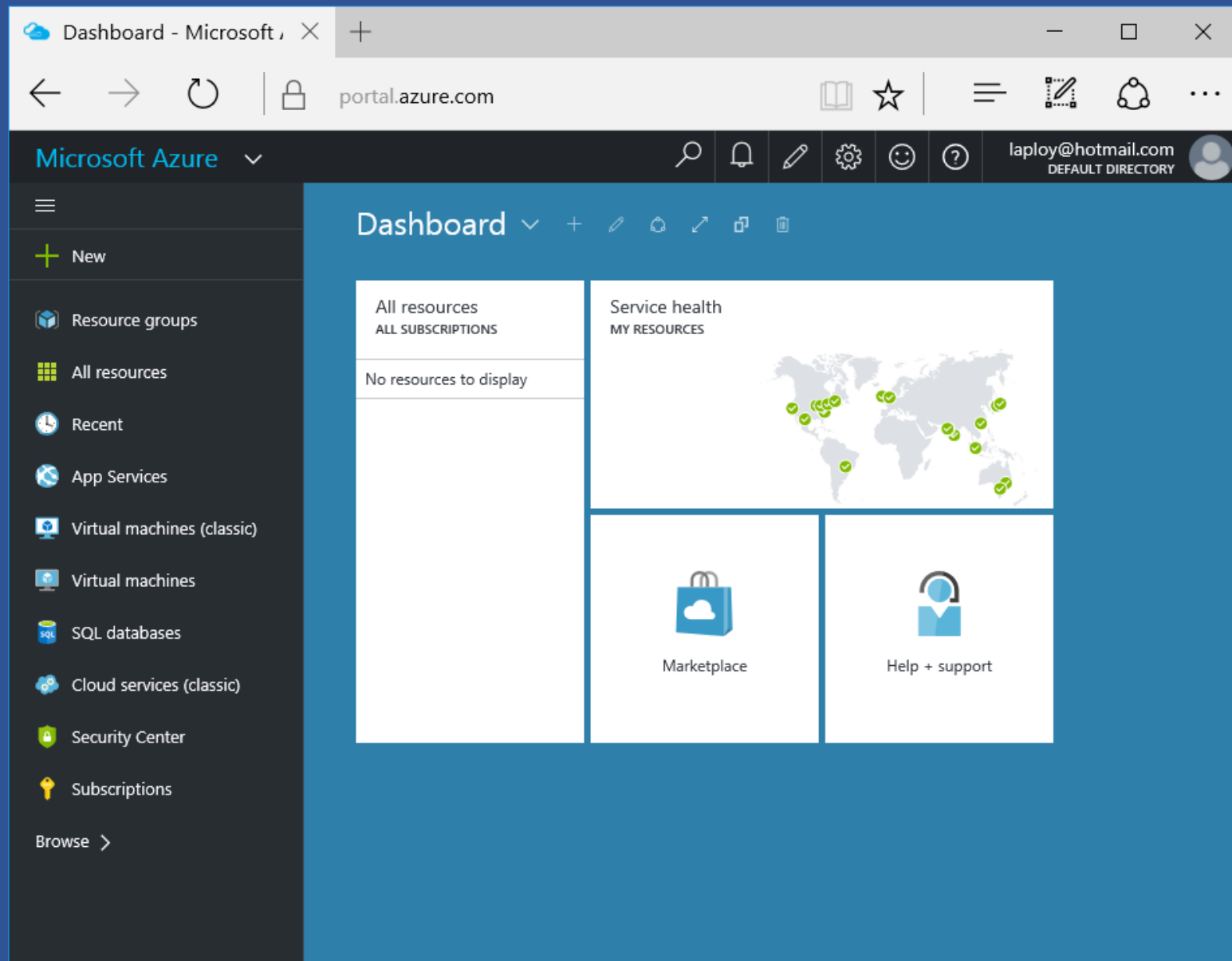
Because you're accessing sensitive info, you need to verify your password.

laploy@hotmail.com

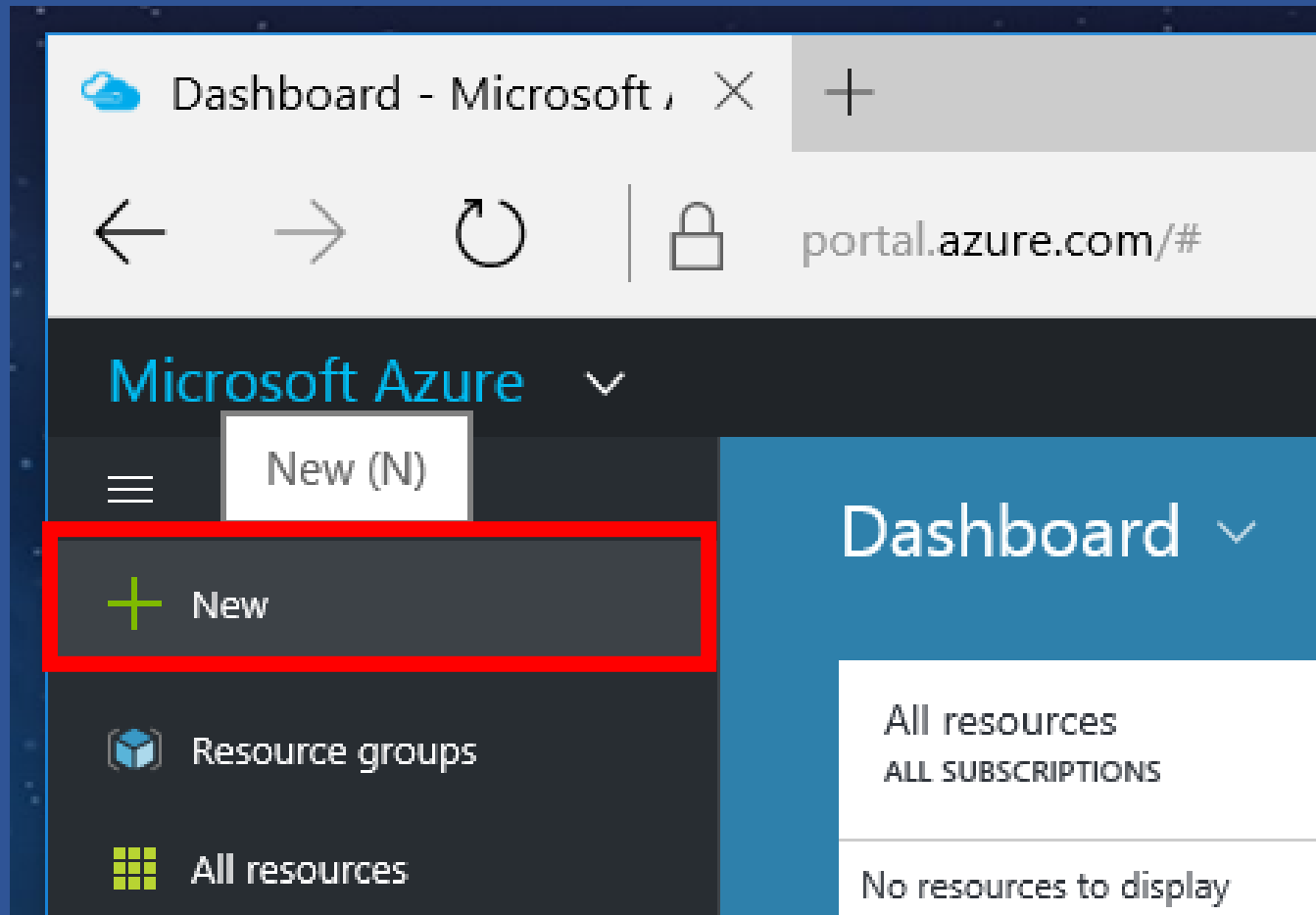
Sign in

[Can't access your account?](#)

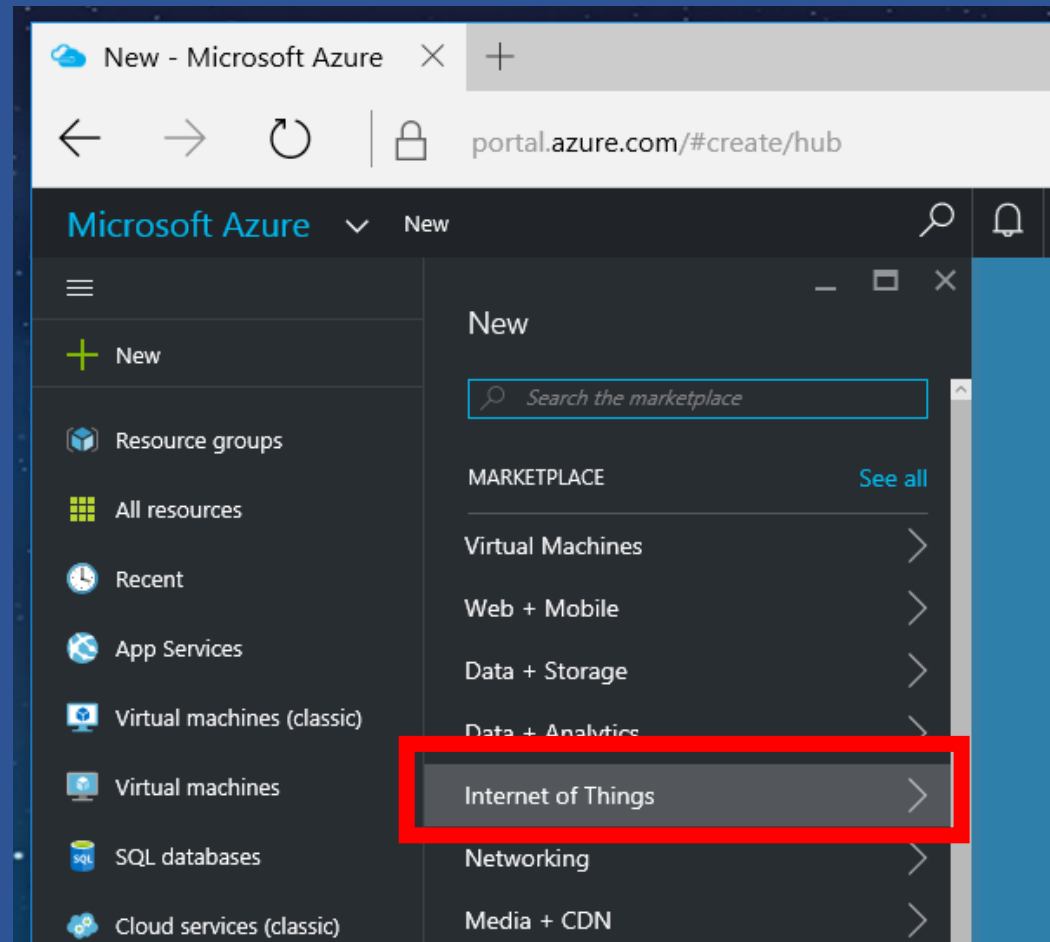
[Sign in with a different Microsoft account](#)



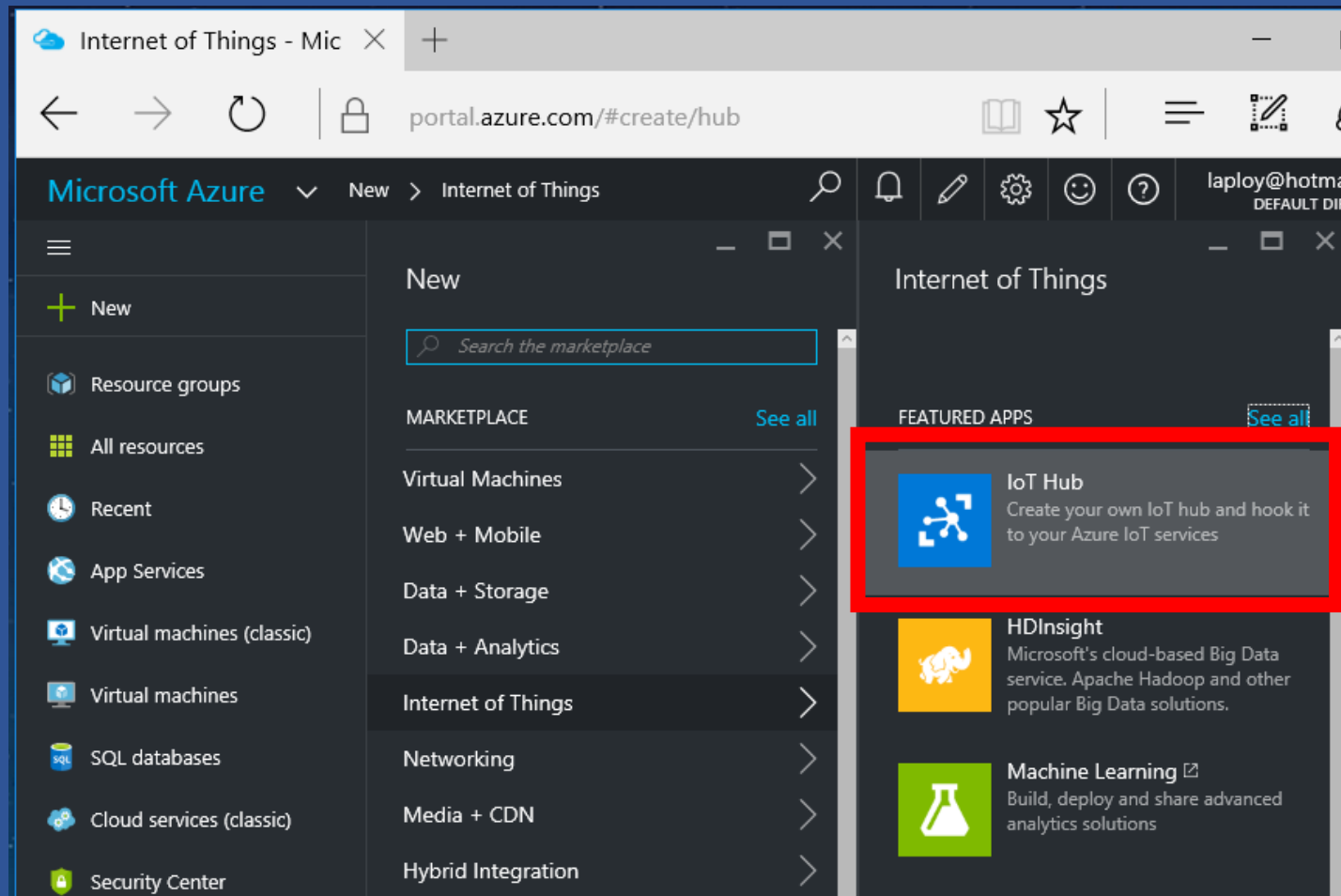
In the Jumpbar, click >New



>Internet of Things

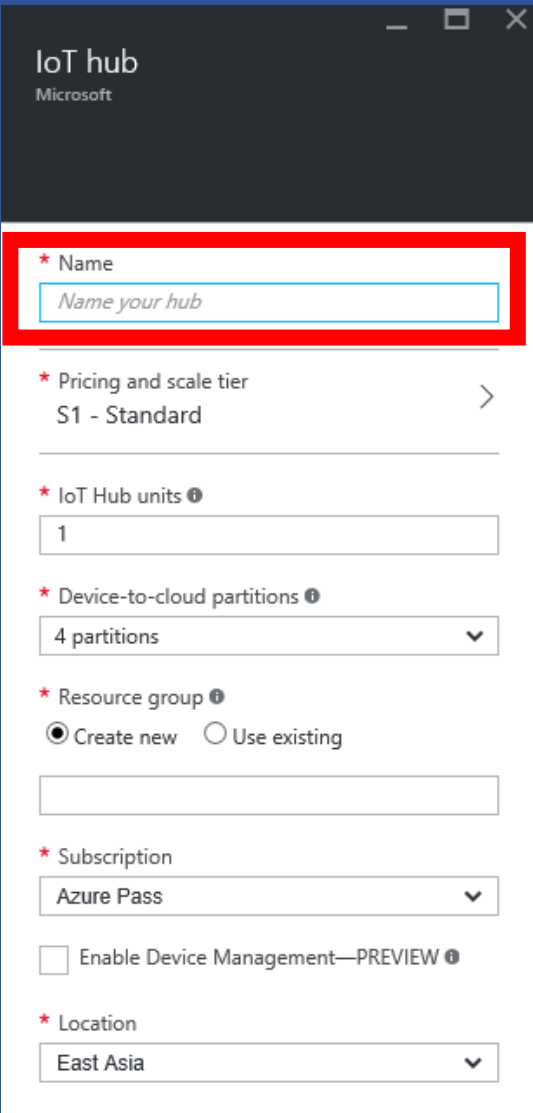


>Azure IoT Hub.



In the IoT hub blade, choose the configuration for your IoT hub

In the **Name box**, enter a name for your IoT hub. If the Name is valid and available, a green check mark appears in the Name box.



IoT hub
Microsoft

* Name
Name your hub

* Pricing and scale tier
S1 - Standard

* IoT Hub units ⓘ
1

* Device-to-cloud partitions ⓘ
4 partitions







* Resource group ⓘ
☒ Create new ☐ Use existing

* Subscription
Azure Pass

☐ Enable Device Management—PREVIEW ⓘ

* Location
East Asia

Select a **pricing and scale tier**. This tutorial does not require a specific tier. For this tutorial, use the free F1 tier.

F1 Free		S1 Standard		S2 Standard	
8k	messages/unit/day	400k	messages/unit/day	6M	messages/unit/day
	Device-to-cloud telemetry		Device-to-cloud telemetry		Device-to-cloud telemetry
	Cloud-to-device messaging		Cloud-to-device messaging		Cloud-to-device messaging
1 unit		200 units maximum		200 units maximum	
0.00		50.00		500.00	
USD PER IOT HUB UNIT		USD PER IOT HUB UNIT		USD PER IOT HUB UNIT	

In Resource group, create a new resource group

Resource group name = rs01

* Name
Loy01 ✓

* Pricing and scale tier
F1 - Free >

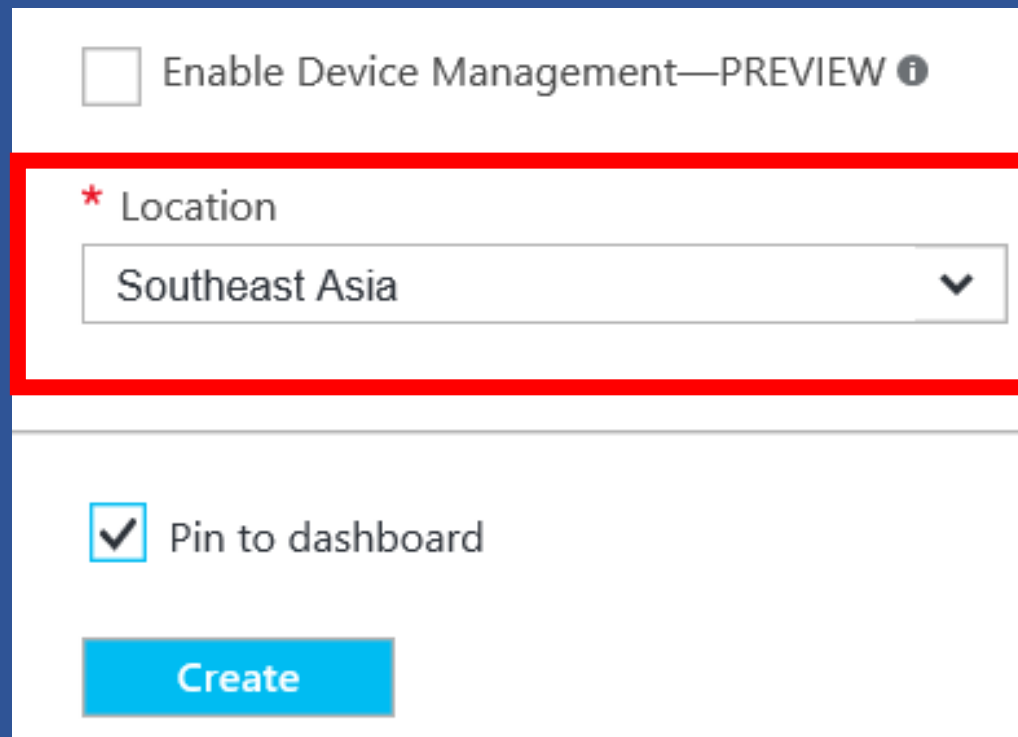
* IoT Hub units ⓘ
1

* Device-to-cloud partitions ⓘ
2 partitions ▼

* Resource group ⓘ
☒ Create new ☐ Use existing
rs01 ✓

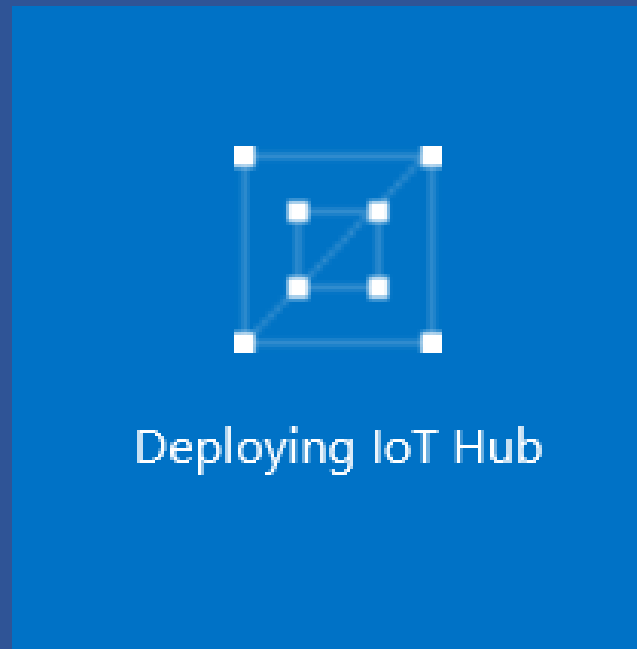
* Subscription
Azure Pass ▼

In Location, select the location to host your IoT hub. For this tutorial, choose **Southeast Asia**



The screenshot shows a form for creating an IoT Hub. At the top, there is a checkbox labeled "Enable Device Management—PREVIEW" with an information icon. Below this, the "Location" field is highlighted with a red border; it is marked with a red asterisk and contains a dropdown menu with "Southeast Asia" selected. Further down, there is a checkbox labeled "Pin to dashboard" which is checked. At the bottom of the form is a blue "Create" button.

Click **Create** and wait for deployment



Deployment Complete

The screenshot displays the Microsoft Azure portal interface for an Azure IoT Hub named 'Loy01'. The browser address bar shows the URL: `portal.azure.com/#resource/subscriptions/bb51e644-fe87-4f6d-8793-f056f529d26c/resourcegroups/rs01/provic`. The page title is 'Settings - Microsoft Azu'. The left navigation pane shows the 'Settings' page selected under the 'Loy01' resource group.

The main content area is divided into two sections: 'Essentials' and 'Usage'.

Essentials

Property	Value
Resource group	rs01
Status	Active
Location	Southeast Asia
Subscription name	Azure Pass
Subscription ID	bb51e644-fe87-4f6d-8793-f056f529d26c
Hostname	Loy01.azure-devices.net
Pricing and scale tier	F1 - Free
IoT Hub units	1

Usage

6/25/2016 UTC
LOY01

MESSAGES
0 / 8k

DEVICES
0

Monitoring

Monitoring
LOY01

The right sidebar contains the following sections:

- SUPPORT + TROUBLESHOOTING**
 - Audit logs
 - New support request
- GENERAL**
 - Shared access policies
 - Messaging
 - File upload
 - Pricing and scale
 - Operations monitoring
 - Diagnostics
- RESOURCE MANAGEMENT**
 - Locks
 - Users
 - Export template

Make note of the Hostname

Essentials ^	
Resource group	Hostname
rs01	Loy01.azure-devices.net
Status	Pricing and scale tier
Active	F1 - Free
Location	IoT Hub units
Southeast Asia	1
Subscription name	
Azure Pass	
Subscription ID	
bb51e644-fe87-4f6d-8793-f056f529d26c	

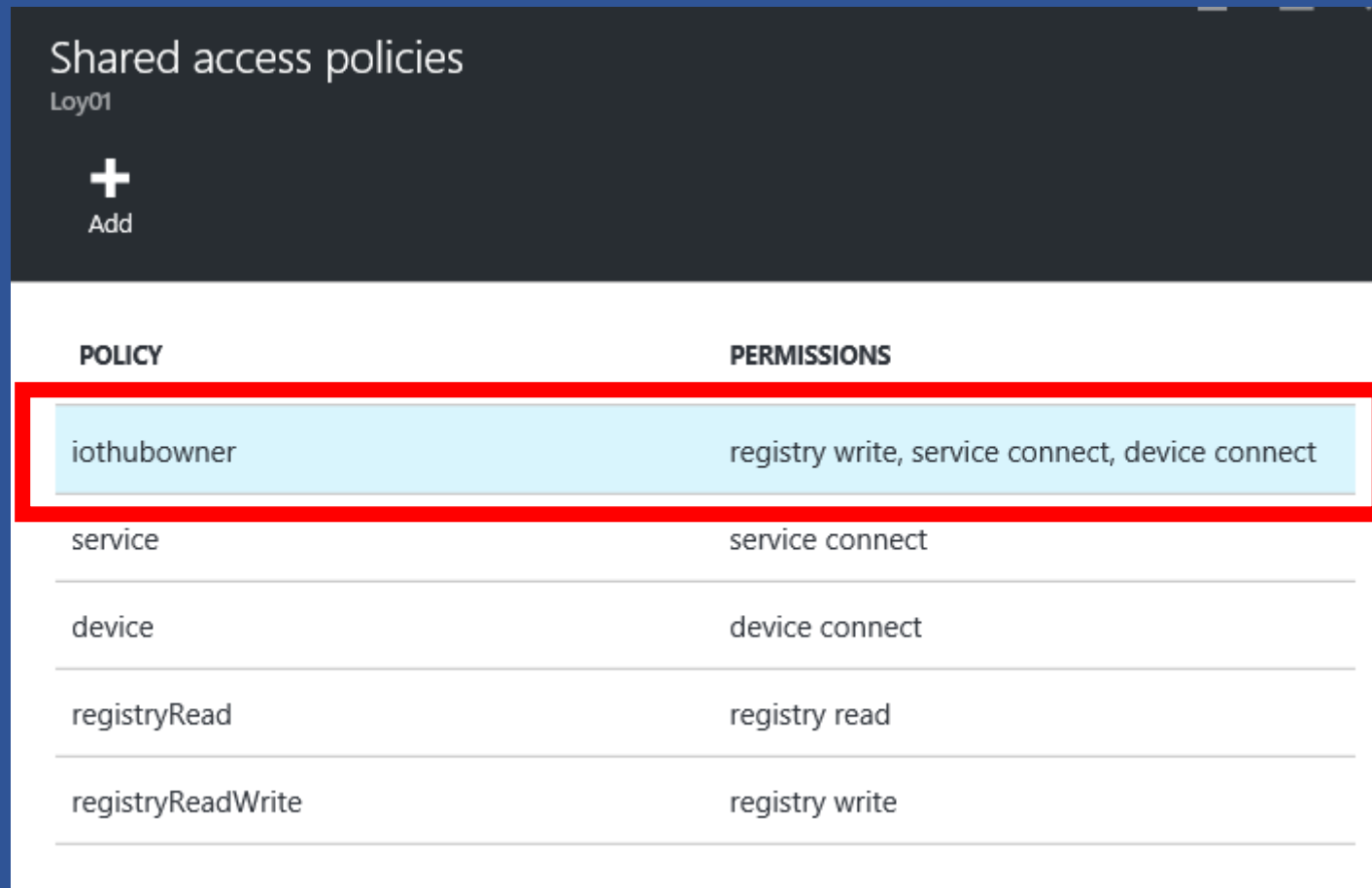
click the Keys icon

Essentials ^

Resource group	Hostname
rs01	Loy01.azure-devices.net
Status	Pricing and scale tier
Active	F1 - Free
Location	IoT Hub units
Southeast Asia	1
Subscription name	
Azure Pass	
Subscription ID	
bb51e644-fe87-4f6d-8793-f056f529d26c	

[All settings →](#)

In the Shared access policies blade, click the iothubowner policy



Shared access policies
Loy01

+
Add

POLICY	PERMISSIONS
iothubowner	registry write, service connect, device connect
service	service connect
device	device connect
registryRead	registry read
registryReadWrite	registry write

copy and make note of the connection string in the iothubowner blade

```
HostName=Loy01.azure-devices.net;  
SharedAccessKeyName=iothubowner;  
SharedAccessKey=H1eC4dcO5a9UKV4I3N3Y  
GkYk0552WJtxmSpGeqKYtGA=
```

The screenshot shows the 'iothubowner' blade in the Azure portal. The 'Access policy name' is 'iothubowner'. Under 'Permissions', 'Registry read', 'Registry write', 'Service connect', and 'Device connect' are all checked. Under 'Shared access keys', the 'Primary key' is 'H1eC4dcO5a9UKV4I3N3YGkYk0552WJtxmSpGeqKYtGA=' and the 'Secondary key' is 'BHWx3IUGvr1RFbBHxtpL6PfF8htWXO4IKf'. The 'Connection string—primary key' is highlighted with a red box and contains the text 'HostName=Loy01.azure-devices.net;SharedAccessKeyName=iothubowner;SharedAccessKey=H1eC4dcO5a9UKV4I3N3YGkYk0552WJtxmSpGeqKYtGA='.

iothubowner
Loy01

Save Discard Regen key Delete

Access policy name
iothubowner

Permissions

- ☒ Registry read
- ☒ Registry write
- ☒ Service connect
- ☒ Device connect

Shared access keys

Primary key
H1eC4dcO5a9UKV4I3N3YGkYk0552WJtxmSpGeqKYtGA=

Secondary key
BHWx3IUGvr1RFbBHxtpL6PfF8htWXO4IKf

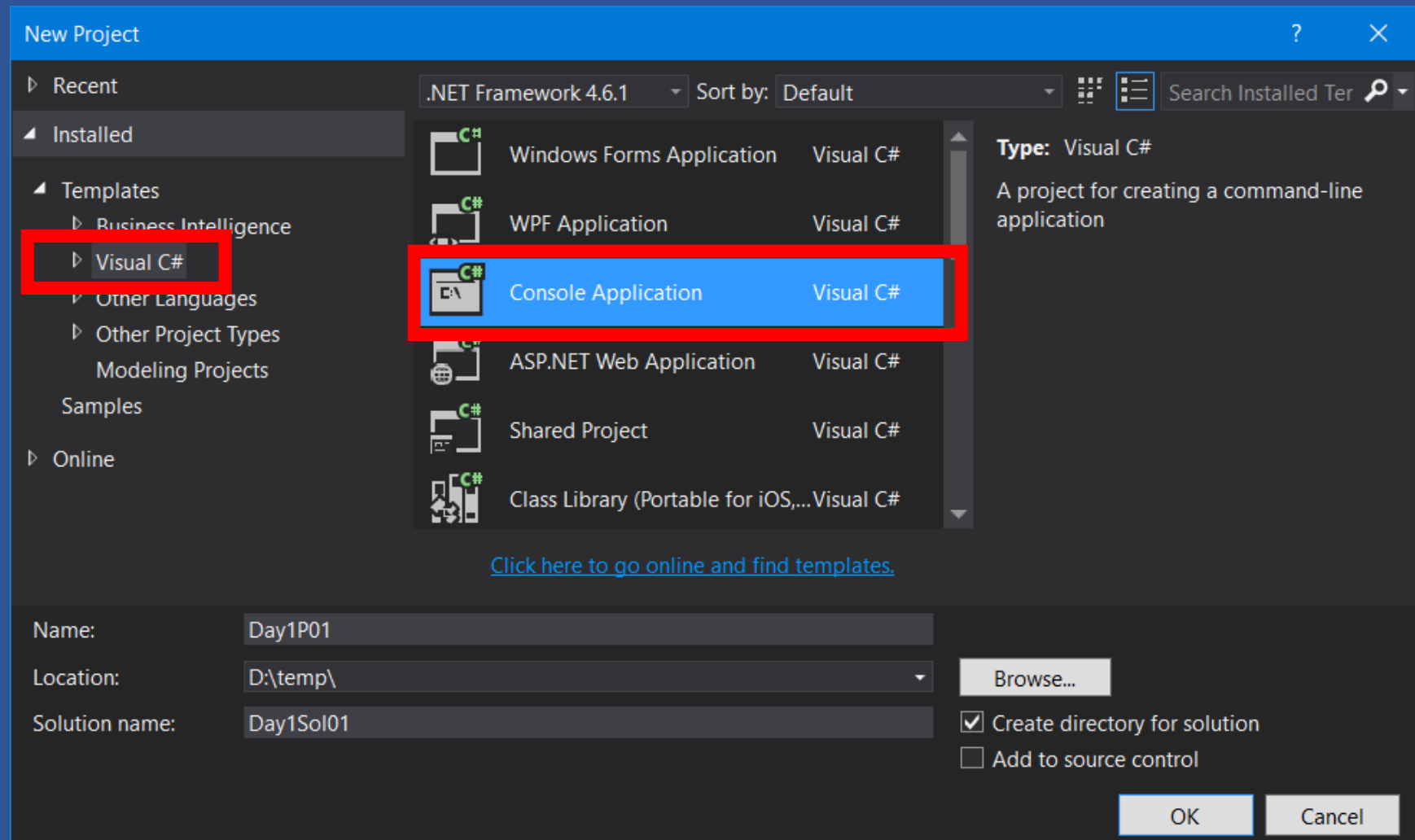
Connection string—primary key
HostName=Loy01.azure-devices.net;SharedAccessKeyName=iothubowner;SharedAccessKey=H1eC4dcO5a9UKV4I3N3YGkYk0552WJtxmSpGeqKYtGA=

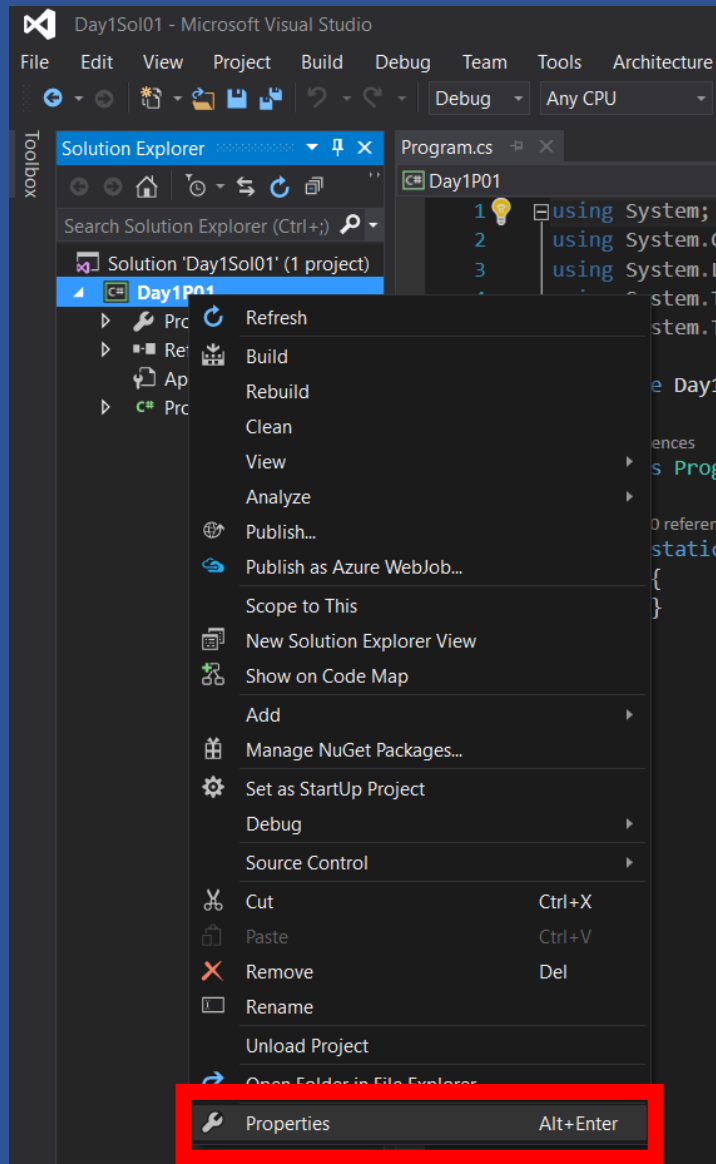
Connection string—secondary key
HostName=Loy01.azure-devices.net;SharedAccessKeyName=iothubowner;SharedAccessKey=BHWx3IUGvr1RFbBHxtpL6PfF8htWXO4IKf

Create a device identity

- A device cannot connect to IoT hub unless it has an entry in the device identity registry.
- Create a Windows console app that creates a new device identity in the identity registry in your IoT hub
- This console app generates a **unique device ID** and **key** that your device can use to identify itself when it sends device-to-cloud messages to IoT Hub.

Create New a new Visual C# Console Application

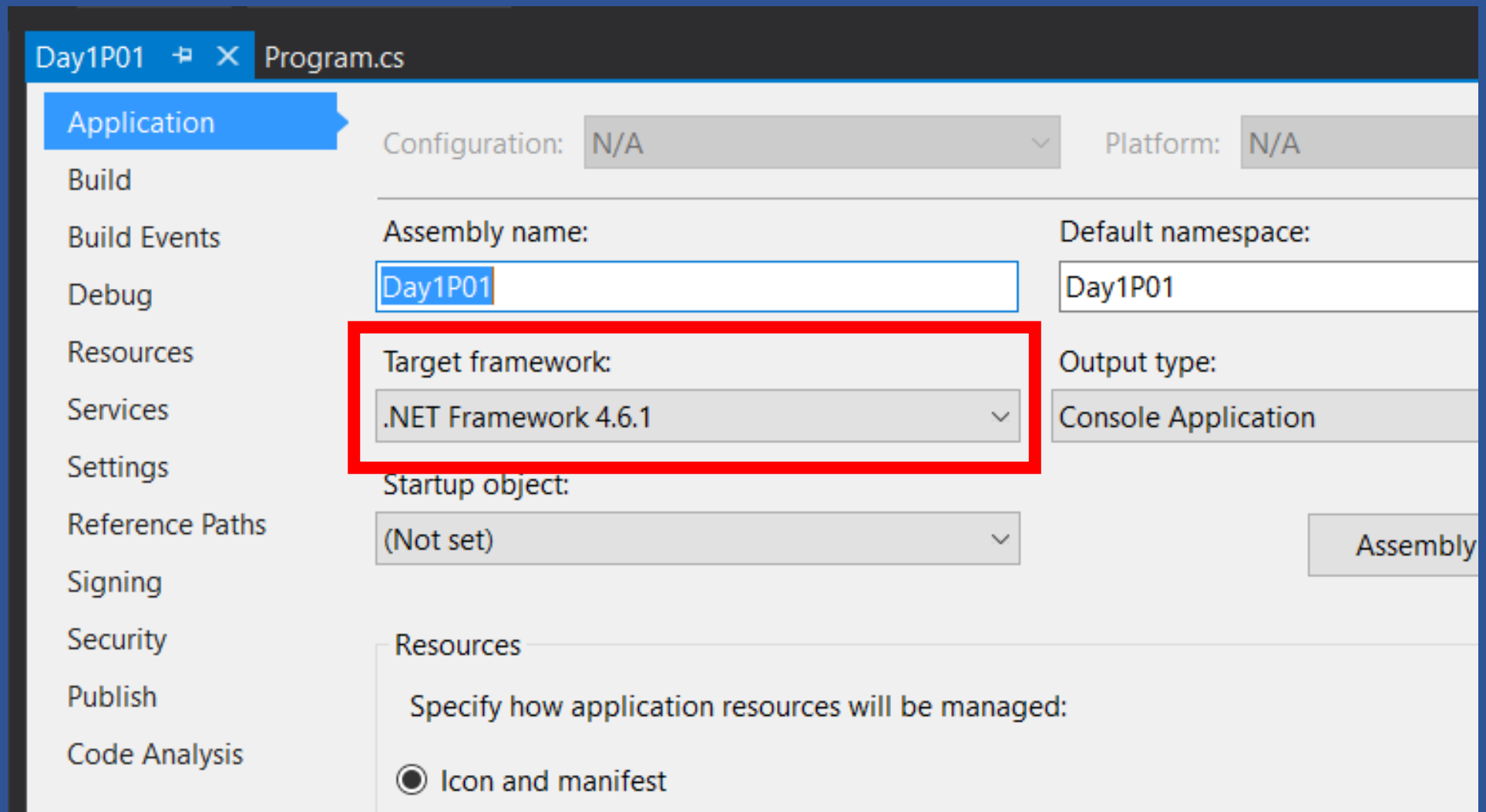




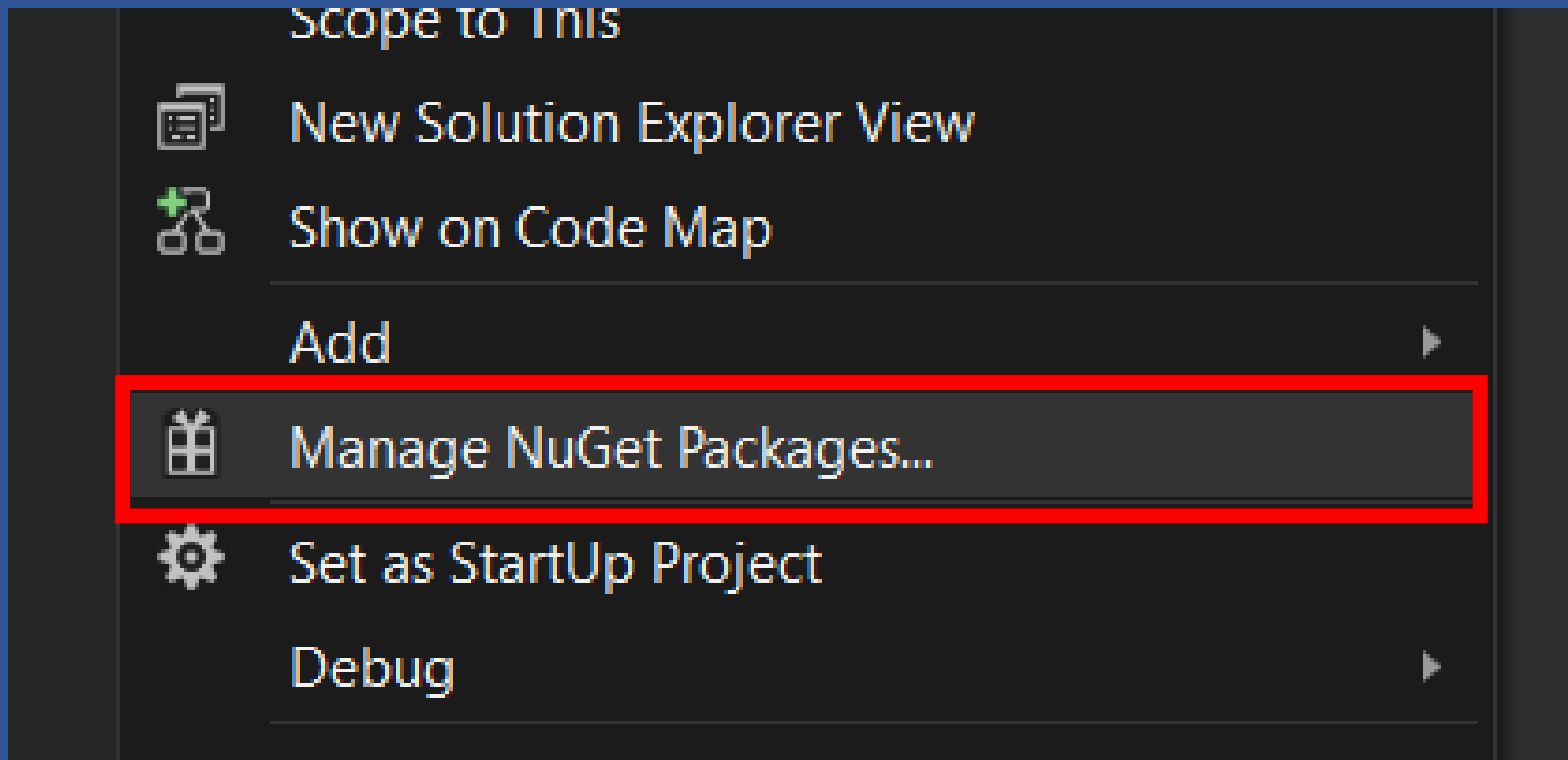
Right Click at the Project name

Select Properties

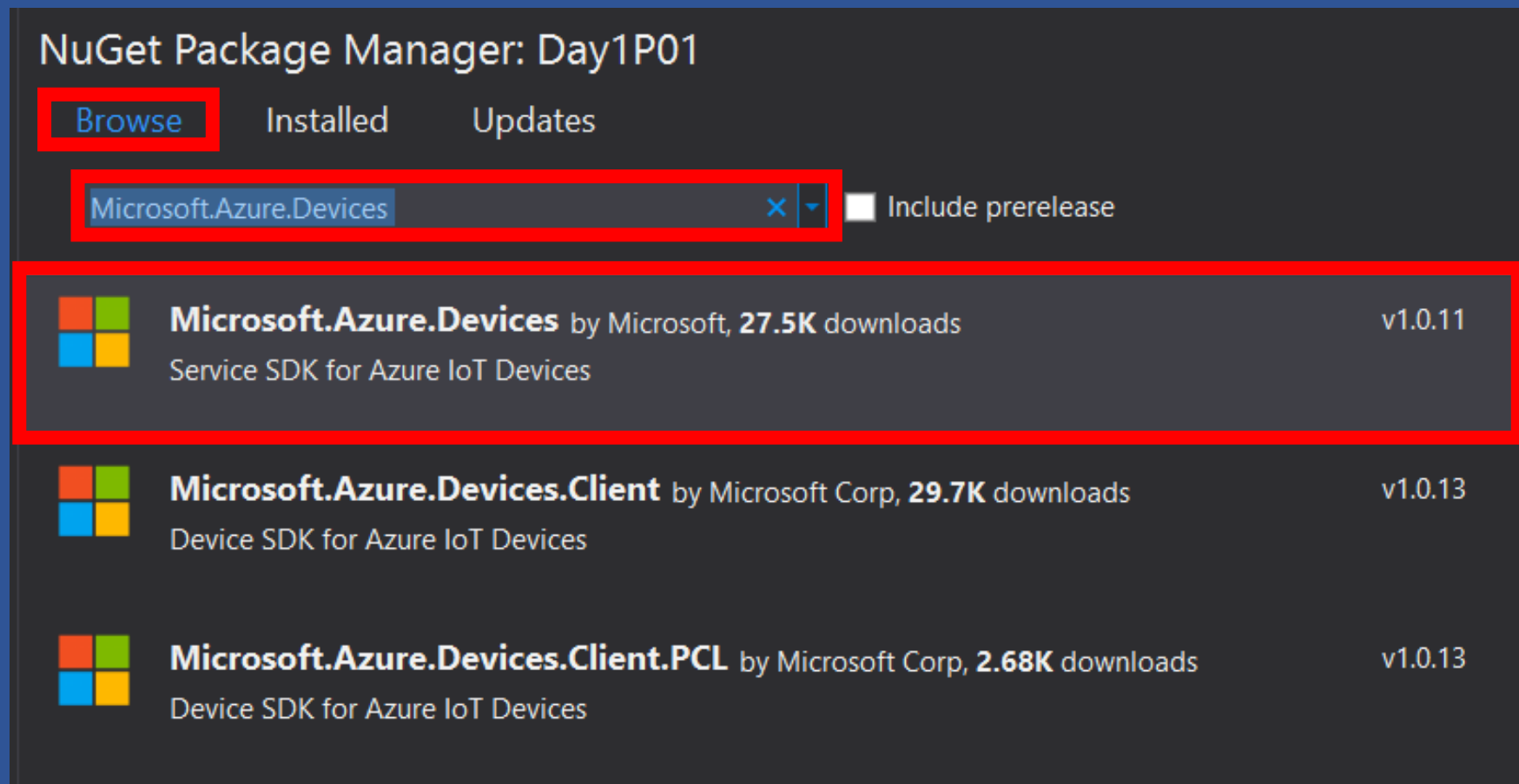
Make sure the .NET Framework version is 4.5.1 or later.



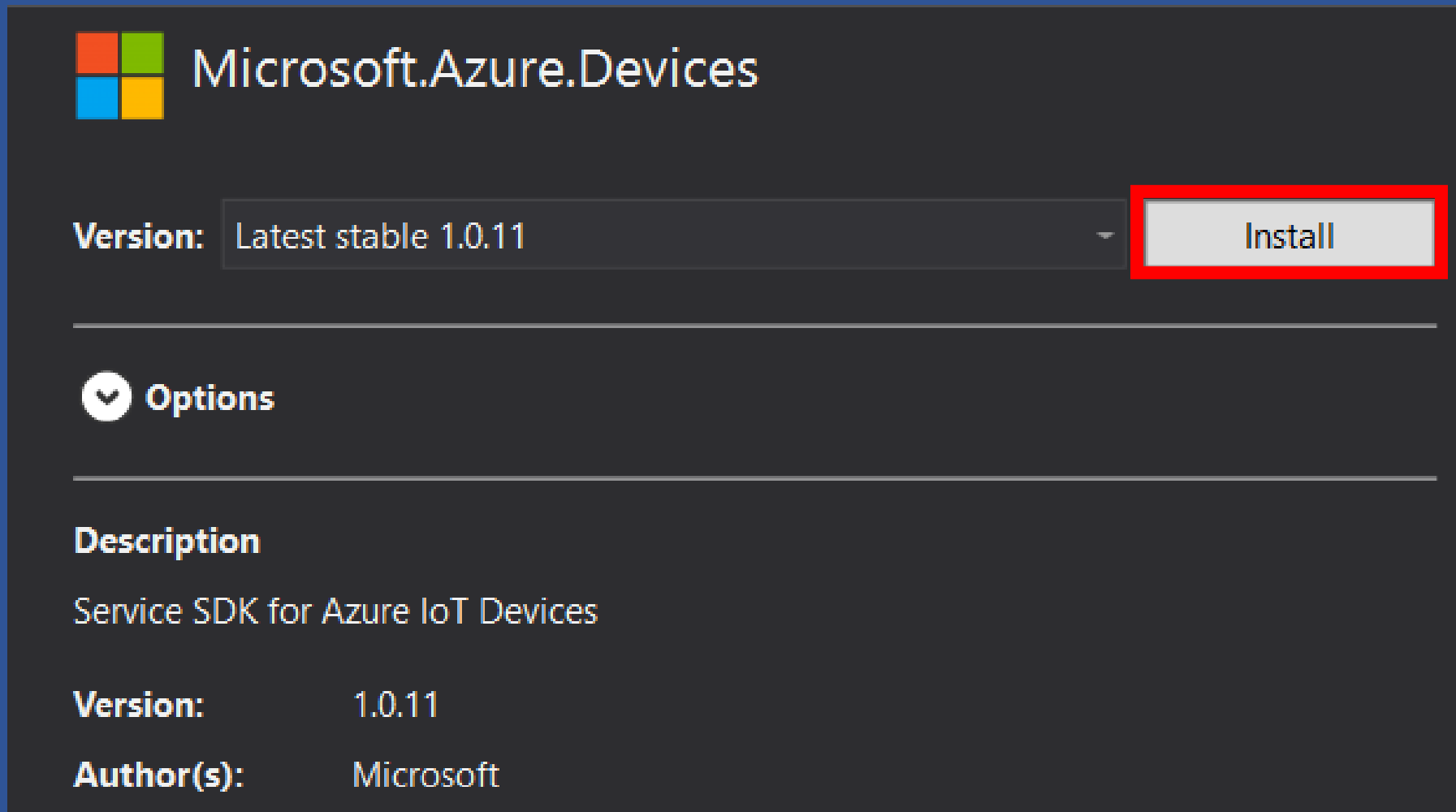
In Solution Explorer, right-click the project, and then click Manage NuGet Packages.



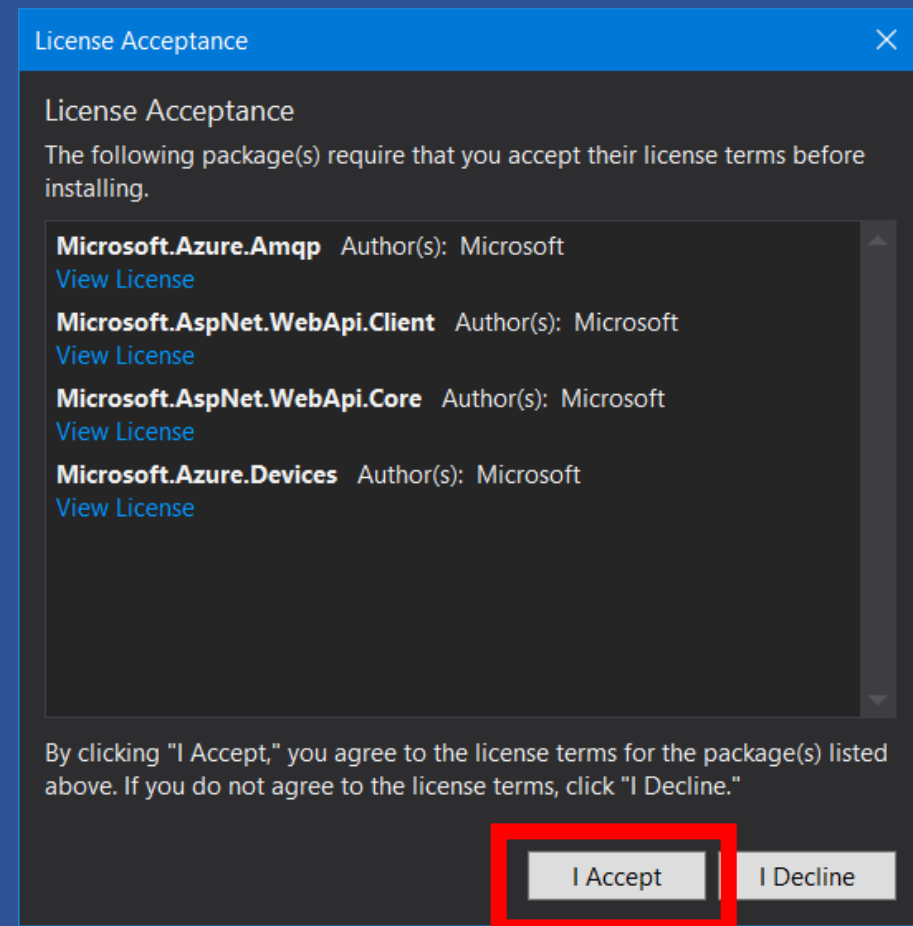
In the NuGet Package Manager window, select Browse, search for microsoft.azure.devices



- Select Install to install the Microsoft.Azure.Devices package,



- and accept the terms of use.
- This downloads, installs, and adds a reference to the Microsoft Azure IoT Service SDK NuGet package and its dependencies.



Add the following using statements at the top of the Program.cs file

```
using System;  
using System.Collections.Generic;  
using System.Linq;  
using System.Text;  
using System.Threading.Tasks;  
  
using Microsoft.Azure.Devices;  
using Microsoft.Azure.Devices.Common.Exceptions;
```


Add the following fields to the Program class. Replace the placeholder value with the connection string for the IoT hub that you created in the previous section.

```
namespace Day1P01
{
    0 references
    class Program
    {
        static RegistryManager registryManager;
        static string connectionString = "{iothub connection string}";
        0 references
        static void Main(string[] args)
        {
        }
    }
}
```

Add the following method to the Program class

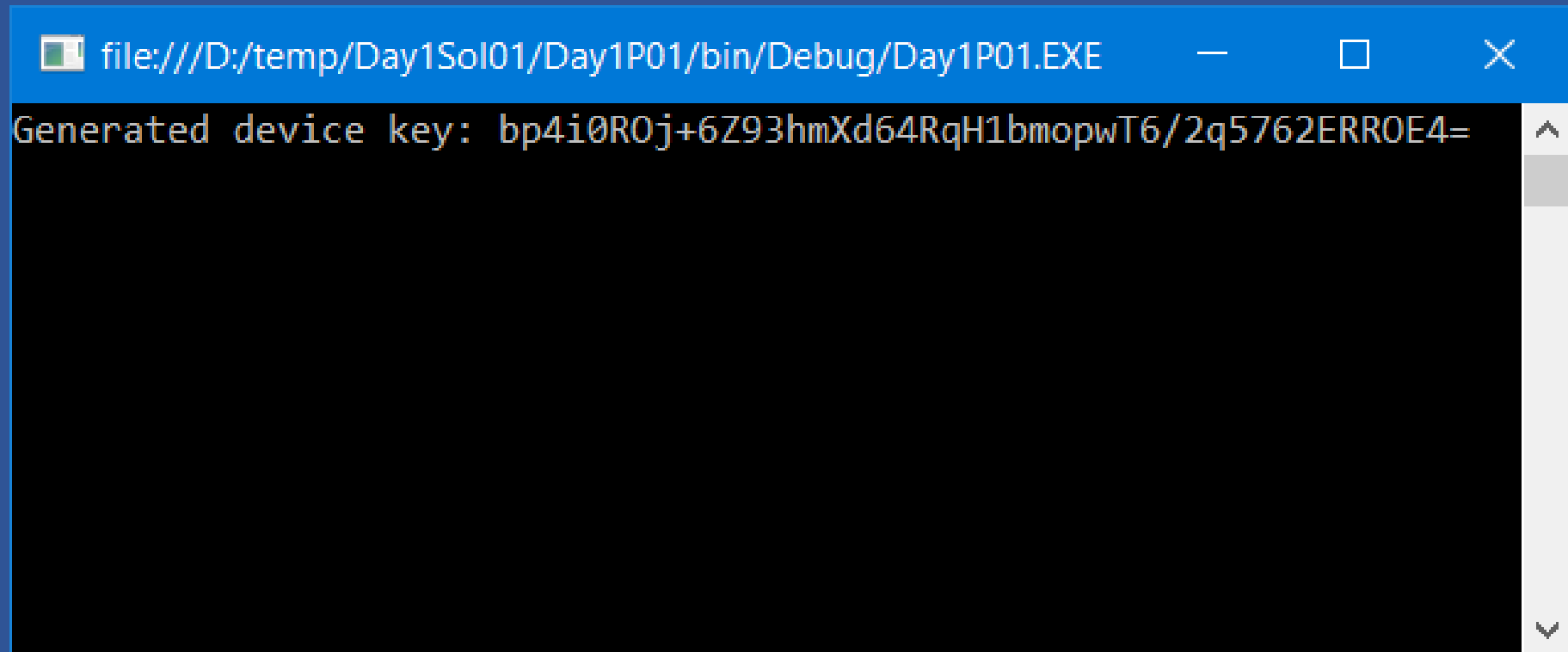
```
private static async Task AddDeviceAsync()
{
    string deviceId = "myFirstDevice";
    Device device;
    try
    {
        device = await registryManager.AddDeviceAsync(new Device(deviceId));
    }
    catch (DeviceAlreadyExistsException)
    {
        device = await registryManager.GetDeviceAsync(deviceId);
    }
    Console.WriteLine("Generated device key: {0}", device.Authentication.SymmetricKey.PrimaryKey);
}
```

- This method creates a new device myFirstDevice.
- If that device ID already exists in the registry, the code simply retrieves the existing device information.
- The app then displays the primary key for that identity.
- You will use this key in the simulated device to connect to your IoT hub.

Finally, add the following lines to the Main method:

```
static void Main(string[] args)
{
    registryManager = RegistryManager.CreateFromConnectionString(connectionString);
    AddDeviceAsync().Wait();
    Console.ReadLine();
}
```

Run this application, and make a note of the device key.



A screenshot of a Windows command prompt window. The title bar is blue and contains the text "file:///D:/temp/Day1Sol01/Day1P01/bin/Debug/Day1P01.EXE" along with standard window controls (minimize, maximize, close). The command prompt area has a black background with yellow text. The text displayed is "Generated device key: bp4i0R0j+6Z93hmXd64RqH1bmopwT6/2q5762ERROE4=". A vertical scrollbar is visible on the right side of the command prompt window.

```
file:///D:/temp/Day1Sol01/Day1P01/bin/Debug/Day1P01.EXE
Generated device key: bp4i0R0j+6Z93hmXd64RqH1bmopwT6/2q5762ERROE4=
```

More information on Creating device

Connect your device to Azure IoT Hub

<https://azure.microsoft.com/en-us/develop/iot/get-started/>