

Azure Maps & Friends IoT Central

Johannes Kebeck
06/19/2022

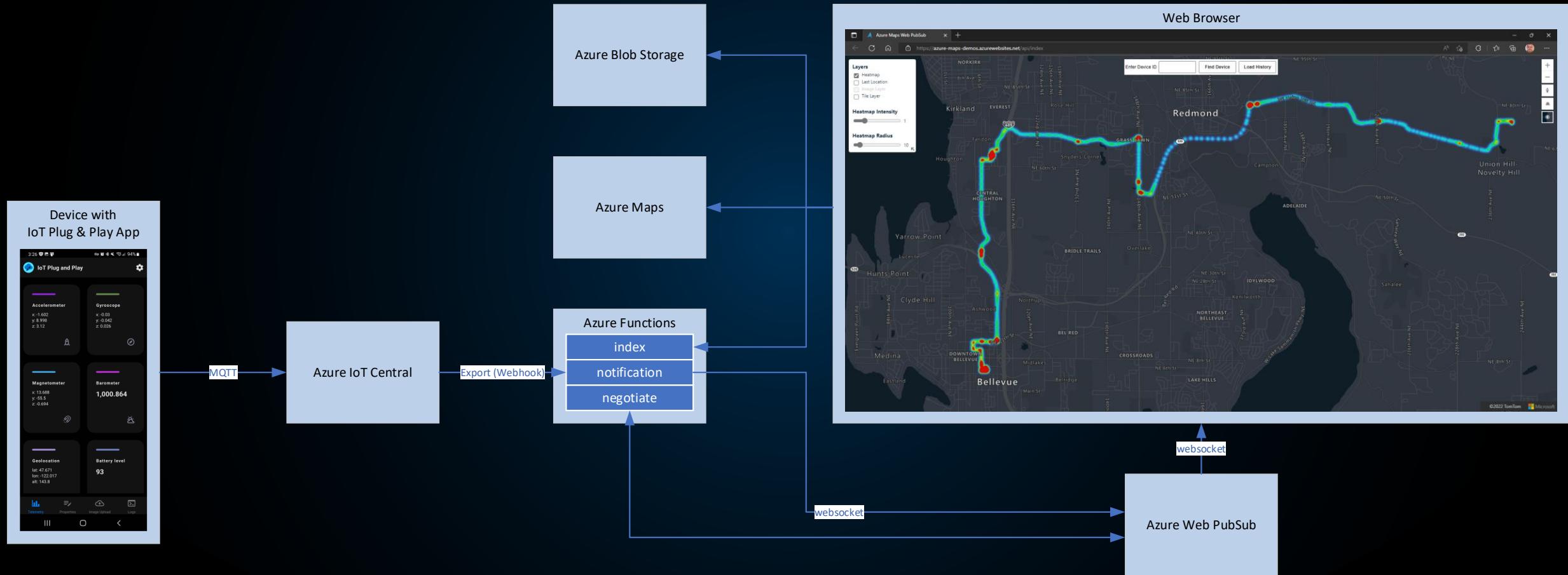
Step-by-Step

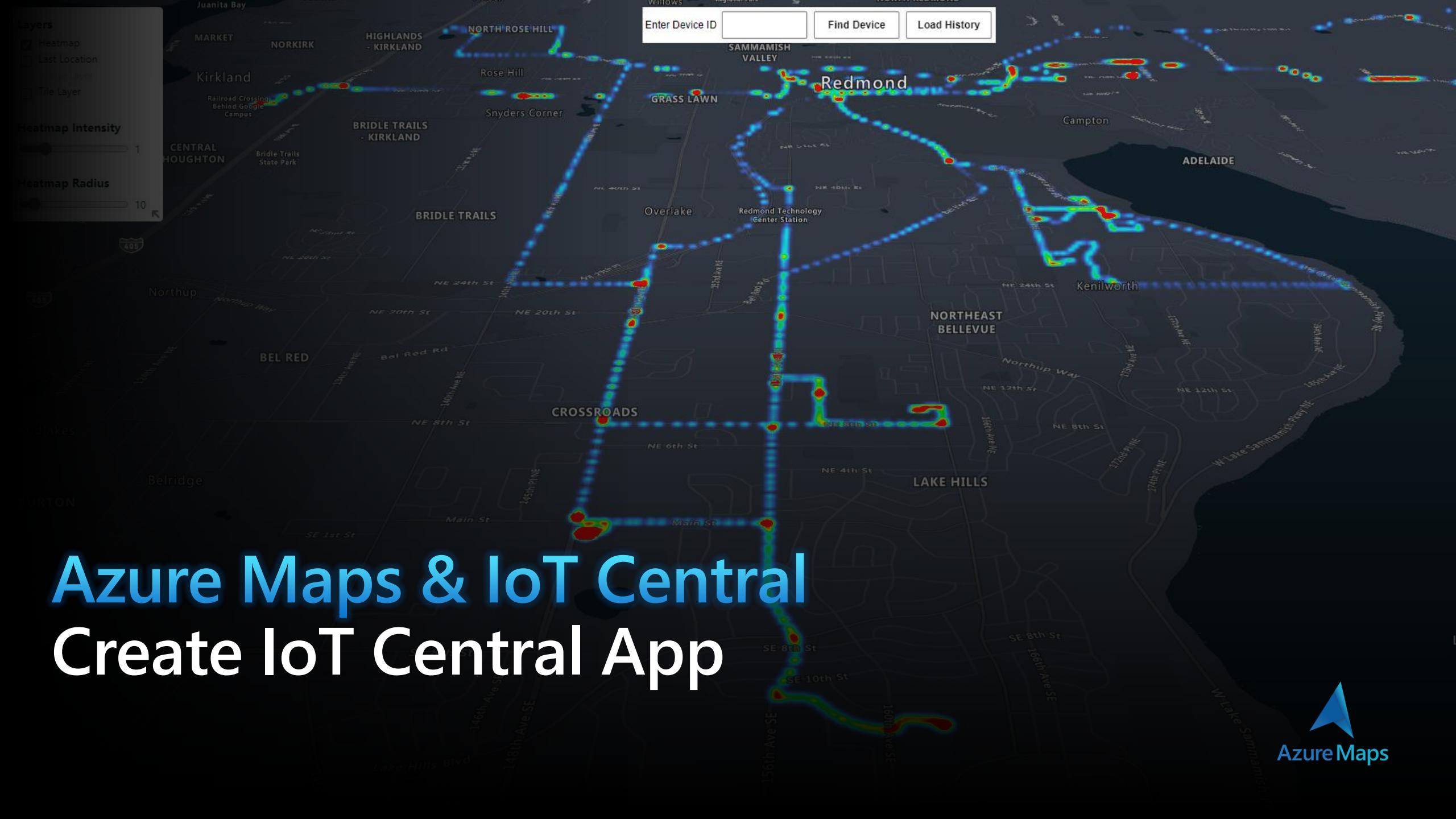
1. Create IoT Central Application
2. Add Device(s)
3. Create Azure Web PubSub
4. Create & Run Azure Functions Locally
5. Modify Notification Function
6. Create Azure Maps Account
7. Modify Web Page in Azure Function
8. Deploy Function App to Azure
9. Export from IoT Central to Webhook
10. Simulating Movement (Data Capture)
11. Simulating Movement (Data Replay)
12. Export from IoT Central to Storage
13. Process History
14. Create your own Tile Layer
15. Create your own Image Overlay
16. Add the Website to IoT Central
17. Visualize the Data with Power BI

Prerequisites

1. Azure Subscription
2. Azure IoT Central Account
3. Visual Studio Code with extension(s)
 - Azure Functions
4. Node.js
5. Azure Function Core Tools
6. Azure CLI
7. Postman
8. Azure Storage Explorer
9. Optional to develop apps for data capturing and replaying
 - Visual Studio Community Edition
 - An IDE to develop for your mobile device (here: Android Studio)
10. QGIS

High-Level Architecture



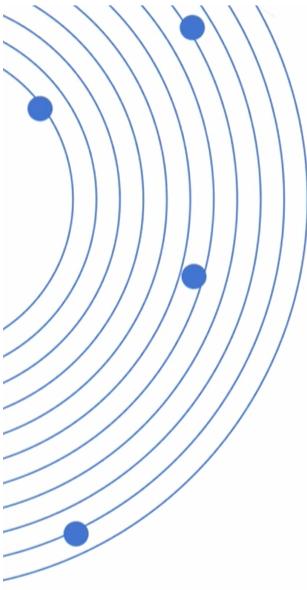


Home | Azure IoT Central

https://apps.azureiotcentral.com/home

Start with IoT Central

An application Platform as a Service (aPaaS)



Azure IoT Central



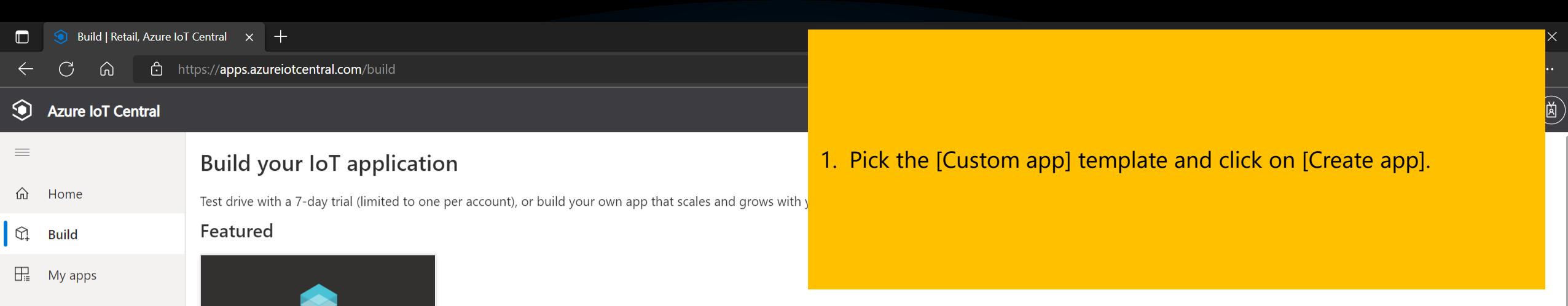
Your ready-made environment for IoT solution development

Go from proof of concept to proof of value

03:09

1. Navigate to the IoT Central [Homepage](#) and log in with your work account.
2. Click on [Build app].

Build app



Build your IoT application

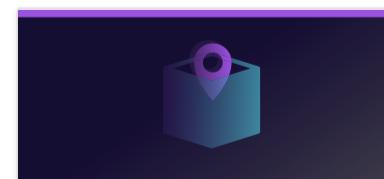
Test drive with a 7-day trial (limited to one per account), or build your own app that scales and grows with you.

Featured



Custom app

Create a custom application to build a unique solution for your business using powerful tools to connect, monitor, and manage your IoT data.

[Create app](#)[Learn more](#)[Retail](#)[Energy](#)[Government](#)[Healthcare](#)

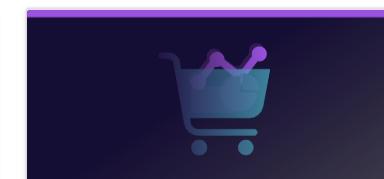
Connected logistics

Track your shipment in real-time

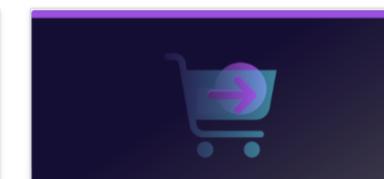


Digital distribution center

Improve warehouse output



In-store analytics – condition monitoring



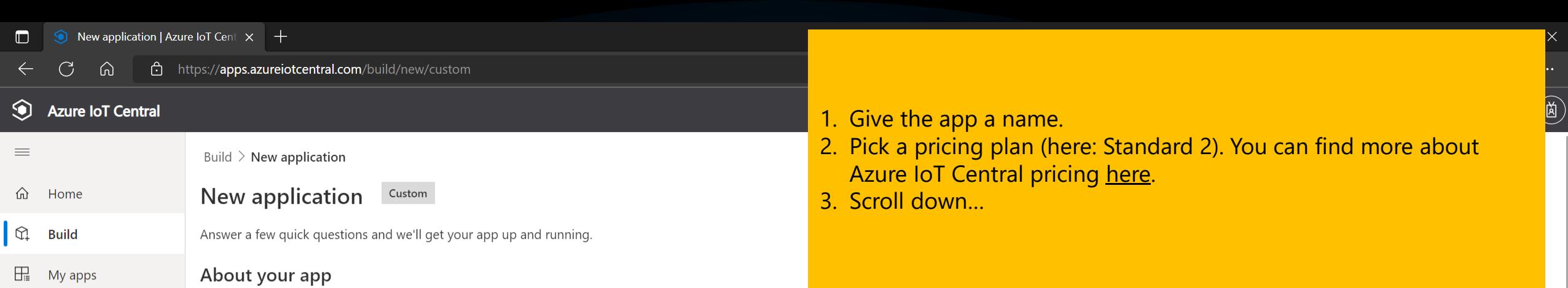
In-store analytics – checkout

Monitor and manage the checkout



Smart inventory management

Use sensors to automate receiving,



Build > New application

New application

Custom

Answer a few quick questions and we'll get your app up and running.

About your app

Application name * ⓘ
Azure Maps Demos

URL * ⓘ
azure-maps-demos.azureiotcentral.com

Application template * ⓘ
Custom application

Pricing plan

Free
Try for 7 days with no commitment
5 free devices

Standard 0
For devices sending a few messages per day
2 free devices 400 messages/mo

Standard 1
For devices sending a few messages per hour
2 free devices 5,000 messages/mo

Standard 2 (most popular)
For devices sending messages every few minutes

We've got you covered

Pricing

No termination fees. Pay only for what you need. [Get pricing details](#)

Security

Protect your connected products with built-in, end-to-end IoT security.
Keep control of your data with privacy features like role-based access and integration with your Active Directory permissions.

Scale

You invest in your business. Microsoft invests in IoT. We're building and inventing every day - when you're ready to scale up, we'll be ready.

New application | Azure IoT Cent X +

https://apps.azureiotcentral.com/build/new/custom

Azure IoT Central

Standard 0
For devices sending a few messages per day
2 free devices 400 messages/mo

Standard 1
For devices sending a few messages per hour
2 free devices 5,000 messages/mo

Standard 2 (most popular)
For devices sending messages every few minutes
2 free devices 30,000 messages/mo

1. ...and pick an Azure Active Directory, a Subscription and a Location to deploy to.
2. Click on [Create]

Billing info

Directory * ⓘ

Microsoft (microsoft.onmicrosoft.com)

Azure subscription * ⓘ

Don't have a subscription? [Create subscription ↗](#)

Azure Maps - SubLib - Loan05

Location * ⓘ

East US

By clicking "Create" you agree to the [Subscription Agreement ↗](#) and [Privacy Statement ↗](#). Provisions in the agreement with respect to pricing, cancellation fees, payment, and data retention do not apply to "Free". "Standard" plans require an Azure subscription, and you acknowledge that this service is licensed to you under the terms applicable to your [Azure Subscription ↗](#).

Create

Cancel

New application | Azure IoT Cent X +

https://apps.azureiotcentral.com/build/new/custom

Azure IoT Central

Home Build My apps

Standard 0
For devices sending a few messages per day
2 free devices 400 messages/mo

Standard 1
For devices sending a few messages per hour
2 free devices 5,000 messages/mo

Standard 2 (most popular)
For devices sending messages every few minutes
2 free devices 30,000 messages/mo

Billing info

Directory * ⓘ
Microsoft (microsoft.onmicrosoft.com)

Azure subscription * ⓘ
Azure Maps - SubLib - Loan05
Don't have a subscription? [Create subscription](#)

Location * ⓘ
East US

1. It will take only a short time to deploy all the resources behind the IoT Central app.

Provisioning your application...

By clicking "Create" you agree to the [Subscription Agreement](#) and [Privacy Statement](#). Provisions in the agreement with respect to pricing, cancellation fees, payment, and data retention do not apply to "Free". "Standard" plans require an Azure subscription, and you acknowledge that this service is licensed to you under the terms applicable to your [Azure Subscription](#).

Create Cancel

Devices | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/devices

Azure Maps Demos

Search for devices

Devices

All devices

+ New Import

To get started with IoT Central, connect a device

Devices will send data to IoT Central for you to view, analyze and export.

New to IoT Central? Get started in minutes

Our quick-start mobile app turns your phone into an IoT device so that you can explore real data in IoT Central.

Let's go

Start IoT solution development

Choose an Azure-ready device from our catalog, or connect a custom device. Try built-in tools like auto-detect to generate a template from device data.

Add a device

Devices

Device groups

Device templates

Data explorer

Dashboards

Jobs

Rules

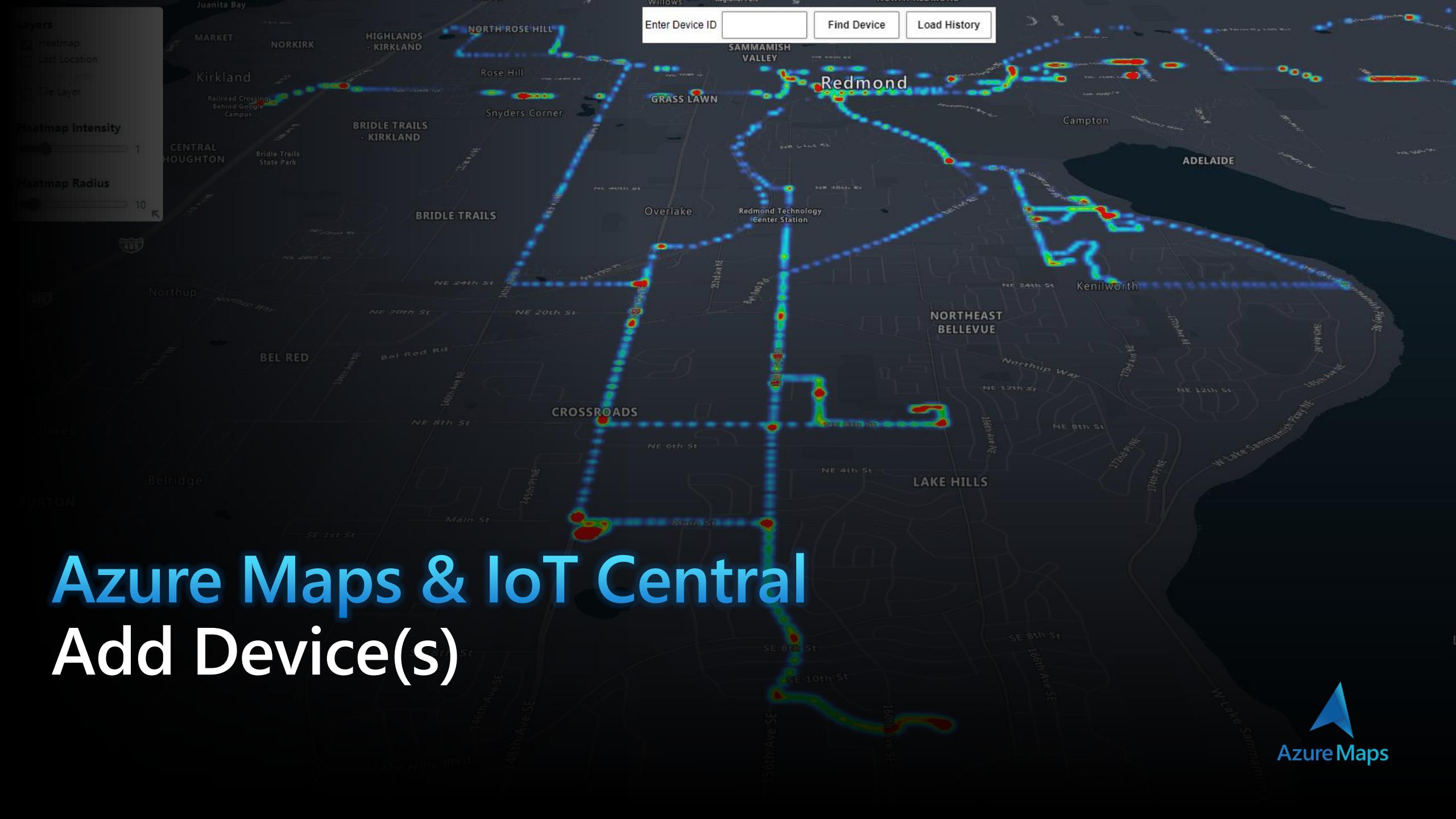
Data export

Permissions

Settings

Application

Customization



Azure Maps & IoT Central

Add Device(s)



Azure Maps

Devices | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/devices

Azure Maps Demos

Devices

All devices

+ New Import

Search for devices

1. Click on [Add a device].

To get started with IoT Central, connect a device

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New to IoT Central? Get started in minutes

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Start IoT solution development

Choose an Azure-ready device from our catalog, or connect a custom device. Try built-in tools like auto-detect to generate a template from device data.

Add a device

Devices

Device groups

Device templates

Data explorer

Dashboards

Jobs

Rules

Data export

Permissions

Settings

Application

Customization

The screenshot shows the Azure IoT Central interface for managing devices. On the left, a sidebar lists various navigation options. The main content area is titled 'Devices' and shows a list of 'All devices'. At the top right of this area, there are buttons for '+ New' and 'Import', and a search bar labeled 'Search for devices'. A prominent yellow callout box covers the top right corner, instructing users to 'Click on [Add a device]'. Below this, a large central panel features two main sections: 'To get started with IoT Central, connect a device' (with a sub-note about devices sending data to IoT Central) and 'New to IoT Central? Get started in minutes' (with a note about turning a phone into an IoT device). Two visual examples are shown: a smartphone displaying its device properties and a cloud icon with a device icon inside, representing connectivity. At the bottom, there are two calls-to-action: 'Let's go' and 'Add a device' (which is highlighted with a yellow border).

Devices | Azure Maps Demos + https://azure-maps-demos.azureiotcentral.com/devices

Azure Maps Demos

Devices

All devices

Create a new device

To create a new device, select a device template, a name, and a unique ID. [Learn more](#)

Device name * ⓘ
DonkeyPhone

Device ID * ⓘ
DonkeyPhone

Organization * ⓘ
Azure Maps Demos

Device template *
Unassigned

Simulate this device?
A simulated device generates telemetry that enables you to test the behavior of your application before you connect a real device.
 No

Create Cancel Add a device

1. Give the device a name and ID.
2. Click on [Create].

Devices

Device groups

Device templates

Data explorer

Dashboards

Jobs

Rules

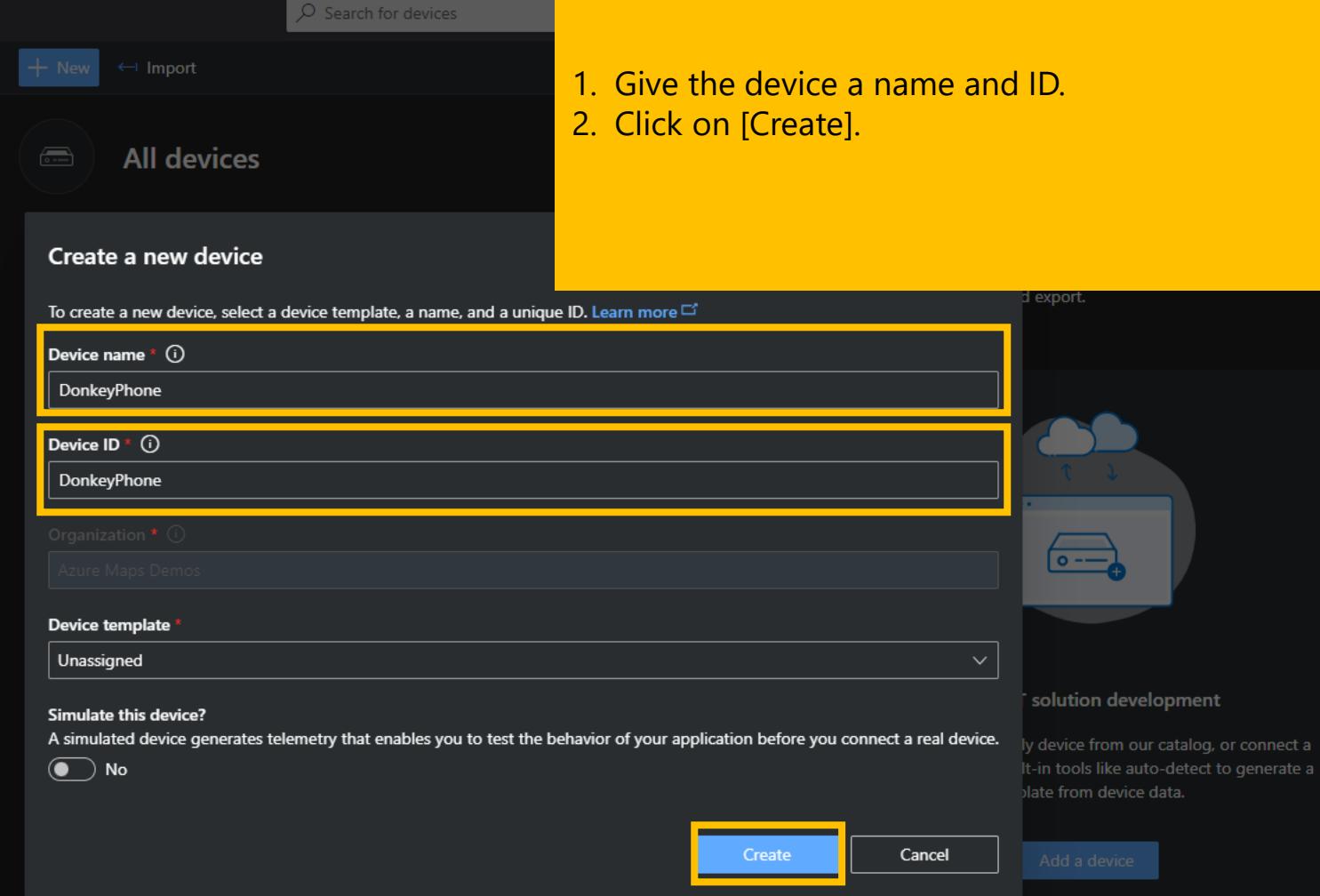
Data export

Permissions

Application

Customization

IoT Central Home



Devices | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/devices

Azure Maps Demos

Devices

All devices

Device name Device ID

DonkeyPhone DonkeyPhone

Registered Unassigned Azure Maps Demos No

1. Click on the name of the newly created device.

The screenshot shows the 'Devices' section of the Azure IoT Central interface. On the left, a sidebar lists various management options like Connect, Devices, Device groups, Device templates, Analyze, Data explorer, Dashboards, Manage, Jobs, Extend, Rules, Data export, Security, Permissions, Settings, Application, Customization, and IoT Central Home. The main area is titled 'All devices' and contains a table with one row. The table has columns for 'Device name' (containing 'DonkeyPhone'), 'Device ID' (containing 'DonkeyPhone'), 'Status' (containing 'Registered'), 'Assignment' (containing 'Unassigned'), 'Owner' (containing 'Azure Maps Demos'), and 'Last Seen' (containing 'No'). A yellow callout box highlights the 'Device name' column, specifically the 'DonkeyPhone' entry. A search bar at the top right says 'Search for devices'.

Raw data | DonkeyPhone, Azure +

https://azure-maps-demos.azureiotcentral.com/devices/details/DonkeyPhone/rawdata

Azure Maps Demos

Search for devices

Connect

Manage template

Manage device

Devices > DonkeyPhone

DonkeyPhone

Last data received: N/A | Status: Registered | Organization: Azure Maps Demos

Raw data Mapped aliases

Timestamp ↓ Message type Event creation time Unmodeled data

No rows found

1. Click on [Connect].

Devices

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

Rules

Data export

Security

Permissions

Settings

Application

Customization

IoT Central Home

Raw data | DonkeyPhone, Azure | +

https://azure-maps-demos.azureiotcentral.com/devices/details/DonkeyPhone/rawdata

Azure Maps Demos

Search for devices

Connect

Devices > DonkeyPhone

DonkeyPhone

Last data received: N/A | Status: Registered | C

Raw data Mapped aliases

Timestamp ↓ Message type

Device connection groups

ID scope ⓘ One00651203

Device ID ⓘ DonkeyPhone

Choose the connection type for this device. You can change this later if you need to.

Authentication type

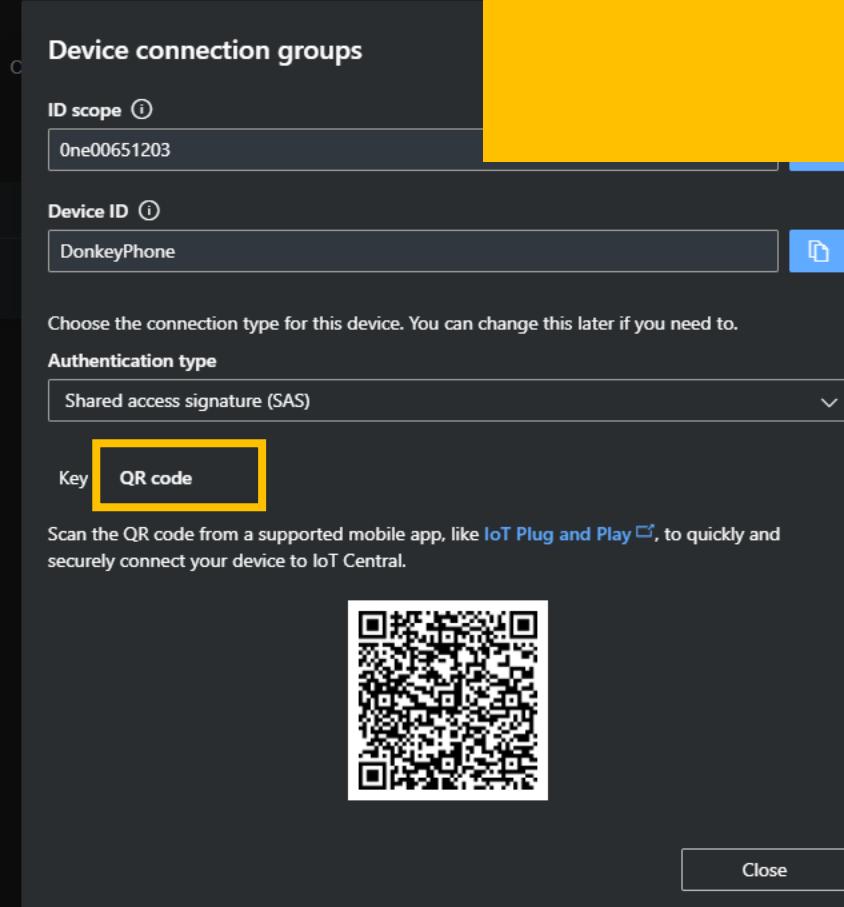
Shared access signature (SAS)

Key QR code

Scan the QR code from a supported mobile app, like IoT Plug and Play [↗](#), to quickly and securely connect your device to IoT Central.

Close

1. In the dialog that pops up select [QR code].



IoT Central Home

3:24



IoT Plug and Play

Microsoft Corporation

4.2★

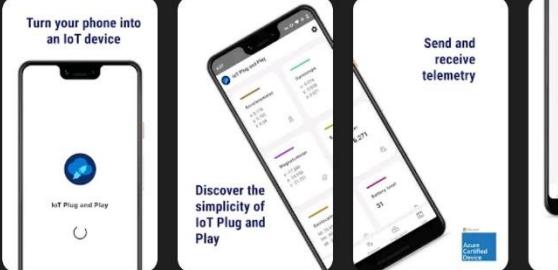
78 reviews

10K+

Downloads

E
Everyone

Install



About this app



Discover the simplicity of IoT

Tools

Data safety

Developers can show information here about how their app collects and uses your data.

[Learn more about data safety](#)

3:25



IoT Plug and Play



Welcome! Connect your phone to the Azure IoT cloud and experience the simplicity of IoT Plug and Play in just a few steps.

Scan QR code

1. On your mobile device install the IoT Plug and Play application.
2. Once installed, launch the app and you're prompted to scan for a QR code.
3. Confirm that the app can use the device's camera.



Allow IoT PnP to take pictures and record video?

While using the app

Only this time

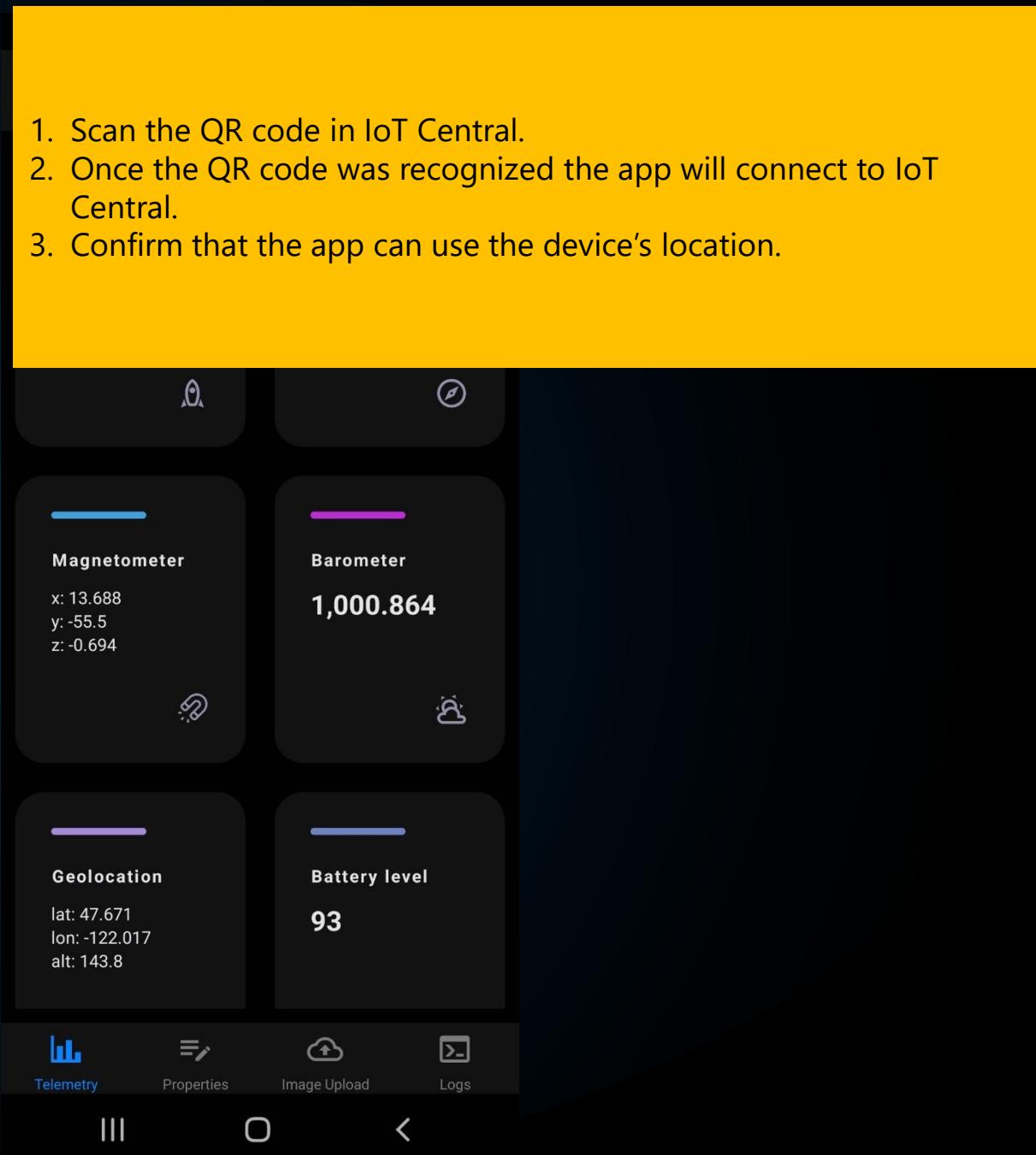
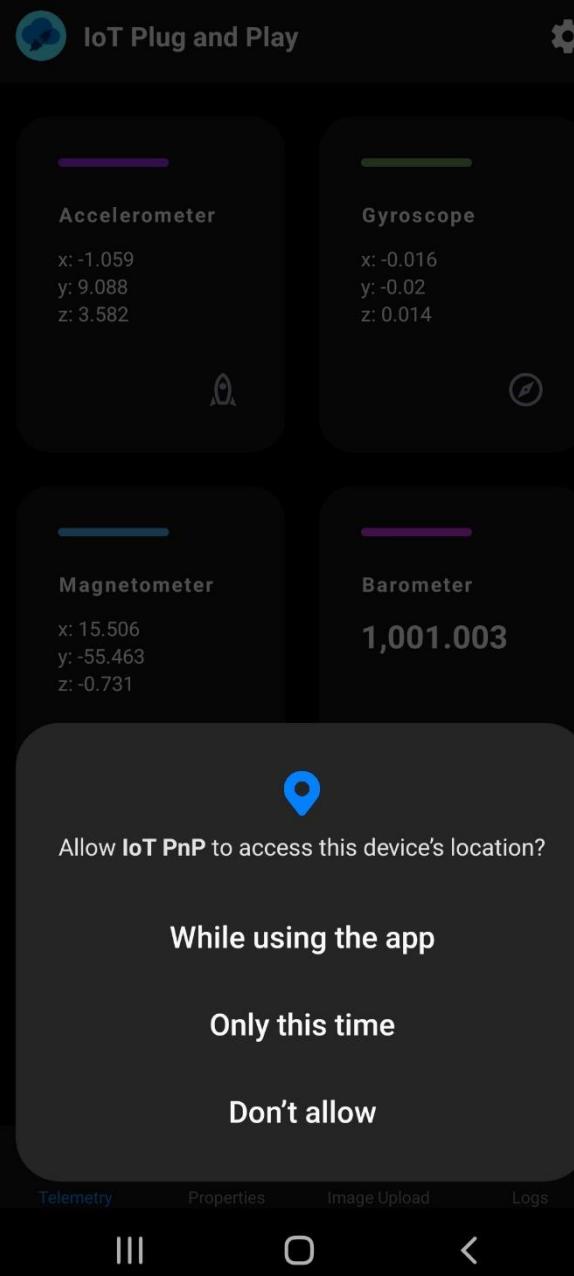
Don't allow

3:25

95%

3:26

94%



Devices | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/devices

Azure Maps Demos

Search for devices

Devices

All devices

Device explorer helps you see all your devices. Detailed information like device raw data helps you troubleshoot. [Learn more](#)

Device name	Device ID	Device status	Device template	Organization	Simulated
DonkeyPhone	DonkeyPhone	Provisioned	IoT Plug and Play mobile	Azure Maps Demos	No

Connect

Devices

All devices

IoT Plug and Play mobile

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

Rules

Data export

Security

Permissions

Settings

Application

Customization

IoT Central Home

+ New Import

Search for devices

Devices

All devices

Device explorer helps you see all your devices. Detailed information like device raw data helps you troubleshoot. [Learn more](#)

Device name	Device ID	Device status	Device template	Organization	Simulated
DonkeyPhone	DonkeyPhone	Provisioned	IoT Plug and Play mobile	Azure Maps Demos	No

1. In IoT Central go back to devices and select your device again.

Get started | DonkeyPhone, Azure IoT Central

https://azure-maps-demos.azureiotcentral.com/devices/details/DonkeyPhone/dtmi:azureiot:PhoneAsADevice:solutionModel:o343mkpcn:1

Azure Maps Demos

Search for devices

Connect Manage template Manage device

Devices > IoT Plug and Play mobile > DonkeyPhone

DonkeyPhone

Connected | Last data received: 6/13/2022, 3:35:09 PM | Status: Provisioned | Organization: Azure Maps Demos

Device properties Get started Overview Commands Raw data Mapped aliases



IoT Plug and Play app

Turn your phone into an IoT device

Download the IoT Plug and Play app on your mobile phone to get started

Follow the QR code or visit <https://aka.ms/iot-paad-getstarted> to learn more about the app.



1. You will find that an IoT Plug and Play template has been applied.

IoT Central Home

Overview | DonkeyPhone, Azure +

https://azure-maps-demos.azureiotcentral.com/devices/details/DonkeyPhone/dtmi:azureiot:PhoneAsADevice:solutionModel:over...

Azure Maps Demos

Search for devices

Connect Manage template Manage device

Devices > IoT Plug and Play mobile > DonkeyPhone

DonkeyPhone

Connected | Last data received: 6/13/2022, 3:35:09 PM | Status: Provisioned | Organization: Azure Maps Demos

Device properties Get started Overview Commands Raw data Mapped aliases

Battery Level 100 now

Altitude 143.80 now

Location NE 80th St, Seattle, WA, USA

Acceleration

Acceleration / X Acceleration / Y Acceleration / Z

0.0 -0.5 -1 5 8 9 03:05 PM 06/13/2022 03:36 PM 06/13/2022

Rotation

Rotation / X Rotation / Y Rotation / Z

0.0 -0.05 -0.1 0.0 -0.1 03:05 PM 06/13/2022 03:36 PM 06/13/2022

Pressure

Pressure

1000.05 0.0 50 03:05 PM 06/13/2022 03:36 PM 06/13/2022

Magnetic induction

Magnetic induction / X Magnetic induction / Y Magnetic induction / Z

0.0 -50 03:05 PM 06/13/2022 03:36 PM 06/13/2022

1. Under Overview you can find the telemetry data coming from the device. In a dashboard that is customized for the template.

IoT Central Home

Raw data | DonkeyPhone, Azure +

https://azure-maps-demos.azureiotcentral.com/devices/details/DonkeyPhone/rawdata

Azure Maps Demos

Search for devices

Connect Manage template Manage device

Devices > IoT Plug and Play mobile > DonkeyPhone

DonkeyPhone

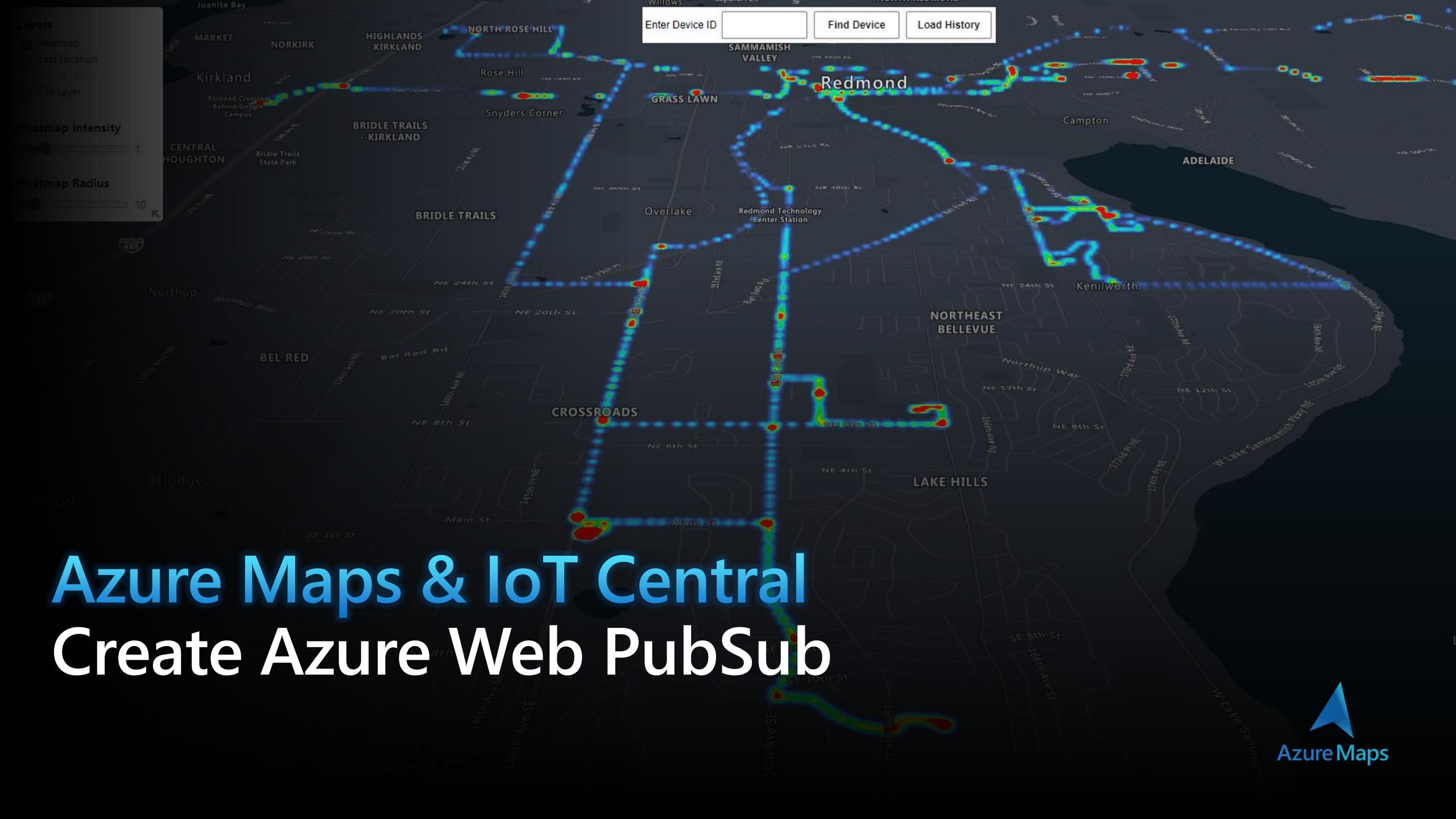
Connected | Last data received: 6/13/2022, 3:39:19 PM | Status: Provisioned | Organization: Azure Maps Demos

Device properties Get started Overview Commands Raw data Mapped aliases

1. You can also explore the Raw data

Timestamp	Message type	Event creation time	Acceleration	Battery Level	Location	Magnetic induction	Pressure
> 6/13/2022, 3:39:19 PM	Telemetry					{"x": -3.5812501907348633, "y": 100.12}	
> 6/13/2022, 3:39:19 PM	Telemetry						1001.12
> 6/13/2022, 3:39:19 PM	Telemetry		{"x": -1.1997014284133911, "y": 100.12}				
> 6/13/2022, 3:39:18 PM	Telemetry				{"lat": 47.6710023, "lon": -122.0174821}		
1	{						
2	"sensors": {						
3	"geolocation": {						
4	"lat": 47.6710023,						
5	"lon": -122.0174821,						
6	"alt": 143.79998779296875						
7	}						
8	},						
9	"_eventtype": "Telemetry",						
10	"_timestamp": "2022-06-13T22:39:18.433Z"						
11	,						
> 6/13/2022, 3:39:18 PM	Telemetry			100			
> 6/13/2022, 3:39:15 PM	Telemetry						
> 6/13/2022, 3:39:14 PM	Telemetry					{"x": -4.21875, "y": -45.168750...}	
> 6/13/2022, 3:39:14 PM	Telemetry						1001.09
> 6/13/2022, 3:39:14 PM	Telemetry		{"x": -0.9499505758285522, "y": 100.12}				
> 6/13/2022, 3:39:13 PM	Telemetry			100			

IoT Central Home



Azure Maps

IOTC - Microsoft Azure

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+)

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Azure Active Directory

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

Monitor

Advisor

Microsoft Defender for Cloud

Cost Management + Billing

Help + support

Home > Resource groups >

Resource groups

Microsoft (microsoft.onmicrosoft.com)

+ Create Manage view

Filter for any field...

Name ↑

cleanupservice

IOTC

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

Locks

Cost Management

Cost analysis

Cost alerts (preview)

Budgets

Advisor recommendations

Monitoring

Insights (preview)

Alerts

Search (Ctrl+ /)

Subscription ID: Azure Maps - SubLib - Loan05

Subscription ID: 2aa49947-b38a-4a9c-957b-8c551c321ba8

Tags (edit): Env : NonProd

Resources Recommendations

Filter for any field... Type == all X Location == all X Add filter

Showing 1 to 1 of 1 records. Show hidden types ⓘ No grouping List view

Name ↑	Type ↑	Location ↑
azure-maps-demos	IoT Central Application	East US

< Previous Page 1 of 1 Next >

Give feedback

1. Navigate to the Azure Portal and there to the resource group that was automatically created when you deployed the Azure IoT Central app.

Create a resource - Microsoft Azure

https://ms.portal.azure.com/#view/Microsoft_Azure_Marketplace/PlusNewBlade/package~/null/additionalConfig~/null/dontDiscardJourney~/true/selectedMenuItemId~/null/createLandi...

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

jokebeck@microsoft.com MICROSOFT (MICROSOFT.ONMIL)

Home > Resource groups > IOTC > Create a resource

Get Started Recently created

Getting Started? Try our Quickstart center

Popular Marketplace products See more in Marketplace

Categories

- AI + Machine Learning
- Analytics
- Blockchain
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things
- IT & Management Tools
- Media
- Migration
- Mixed Reality
- Monitoring & Diagnostics
- Networking
- Security

Search bar: web pubsub

Recent search: Web PubSub Service

Popular Marketplace products:

- Windows Server 2019 Datacenter
- Ubuntu Server 20.04 LTS
- Windows 10 Pro, version 20H2
- Ubuntu Server 18.04 LTS
- Free 100

Yellow callout box: 1. Search for Web PubSub Service

Web PubSub Service - Microsoft

https://ms.portal.azure.com/#view/Microsoft_Azure_Marketplace/GalleryItemDetailsBladeNopdl/product~%7B"displayName"%3A"Web%20PubSub%20Service"%2C"itemDisplayName"%...
Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)  jokebeck@microsoft.com MICROSOFT (MICROSOFT.ONMIL)

Home > Resource groups > IOTC > Create a resource >

Web PubSub Service

Microsoft

 Web PubSub Service  Add to Favorites

★ 4.0 (1 Azure ratings)

Plan

Overview Plans Usage Information + Support Reviews

Azure Web PubSub Service is an Azure managed PaaS service to simplify the development, deployment and management of real time web application using WebSocket, with Azure supported SLA, scaling, performance and security. The service provides API/SDK/CLI/UI, and rich set of code samples, templates, and demo applications.

More products from Microsoft [See All](#)



Active Directory Health Check
Microsoft
Azure Service
Assess the risk and health of Active Directory environments.
 



AD Replication Status
Microsoft
Azure Service
Identify Active Directory replication issues in your environment.
 



Device Update for IoT Hub
Microsoft
Azure Service
Securely and Reliably update your devices with Device Update for IoT Hub.
 

1. Click on Create

Web PubSub Service - Microsoft

https://ms.portal.azure.com/#create/Microsoft.AzureWebPubSub

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Home > Resource groups > IOTC > Create a resource > Web PubSub Service >

Web PubSub Service

Web PubSub Service

* Basics Networking Tags Review + create

Deploy fully managed WebPubSub Service at scale. [Learn more about WebPubSub](#)

Project Details

Subscription * Azure Maps - SubLib - Loan05

Resource group * IOTC

Create new

Service Details

Resource Name azure-maps-demos

.webpubsub.azure.com

Region * East US

Pricing tier * Free

Up to 20 connections, 40,000 KB messages per day included

Change

Review + create Next : Networking > Download a template for automation

1. Provide a name for the resource
2. Select the same region as you used for the IoT Central deployment.
3. Select a pricing tier (here: free)
4. Click on [Next : Networking]

Web PubSub Service - Microsoft

https://ms.portal.azure.com/#create/Microsoft.AzureWebPubSub

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Home > Resource groups > IOTC > Create a resource > Web PubSub Service >

Web PubSub Service

Web PubSub Service

* Basics Networking Tags Review + create

Network connectivity

You can connect to your service either publicly, via public IP addresses or privately, using a private endpoint.

Connectivity method

Public endpoint
 Private endpoint

1. Confirm the public endpoint for the connectivity.
2. Click [Review and Create].

Review + create < Previous : Basics Next : Tags > Download a template for auto

Web PubSub Service - Microsoft

https://ms.portal.azure.com/#create/Microsoft.AzureWebPubSub

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Home > Resource groups > IOTC > Create a resource > Web PubSub Service >

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Web PubSub Service

Web PubSub Service

* Basics Networking Tags Review + create

Summary

Basics

Subscription	Azure Maps - SubLib - Loan05
Resource group	IOTC
Region	East US
Resource Name	azure-maps-demos
Pricing tier	Free
Unit count	1

Networking

Connectivity method	Public
---------------------	--------

1. Click [Create].

Create < Previous : Tags Download a template for automation

A Microsoft.AzureWebPubSub - Mi X +

https://ms.portal.azure.com/#view/HubsExtension/DeploymentDetailsBlade/~/overview/id/%2Fsubscriptions%2F2aa49947-b38a-4a9c-957b-8c551c321ba8%2FresourceGroups%2FIOTC%2B%2BDeployment

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+/)

Home > Microsoft.AzureWebPubSub | Overview Deployment

Deployment in progress... Deployment to resource group 'IOTC' is in progress.

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Search (Ctrl+ /) Delete Cancel Redeploy Refresh

Overview Inputs Outputs Template

We'd love your feedback! →

Deployment is in progress

Deployment name: Microsoft.AzureWebPubSub
Subscription: Azure Maps - SubLib - Loan05
Resource group: IOTC

Start time: 6/13/2022, 5:51:51 PM
Correlation ID: 42f7b5c0-da89-402c-9d42-da708fb412c8

Deployment details (Download)

Resource	Type	Status	Operation details
No results.			

1. Wait for the deployment to complete.

IOTC - Microsoft Azure

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Home > Resource groups >

Resource groups

Microsoft (microsoft.onmicrosoft.com)

Create Manage view ...

Filter for any field...

Name ↑

cleanupservice ...

IOTC ...

Overview Activity log Access control (IAM) Tags Resource visualizer Events

Settings Deployments Security Policies Properties Locks

Cost Management Cost analysis Cost alerts (preview) Budgets Advisor recommendations

Monitoring Insights (preview) Alerts

< Page 1 > of 1

1. Confirm that the deployment was completed.

IOTC Resource group

Search (Ctrl+ /)

Overview Activity log Access control (IAM) Tags Resource visualizer Events

Subscriptions

Azure Maps - SubLib - Loan05 1 Succeeded

Subscription ID 2aa49947-b38a-4a9c-957b-8c551c321ba8 Location East US

Tags (edit) Env : NonProd

Resources Recommendations

Filter for any field... Type == all X Location == all X Add filter

Showing 1 to 2 of 2 records. Show hidden types No grouping List view

Name	Type	Location
azure-maps-demos	IoT Central Application	East US
azure-maps-demos	Web PubSub Service	East US

< Previous Page 1 of 1 Next >

Give feedback

Home

Dashboard

All services

FAVORITES

All resources

Azure Active Directory

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

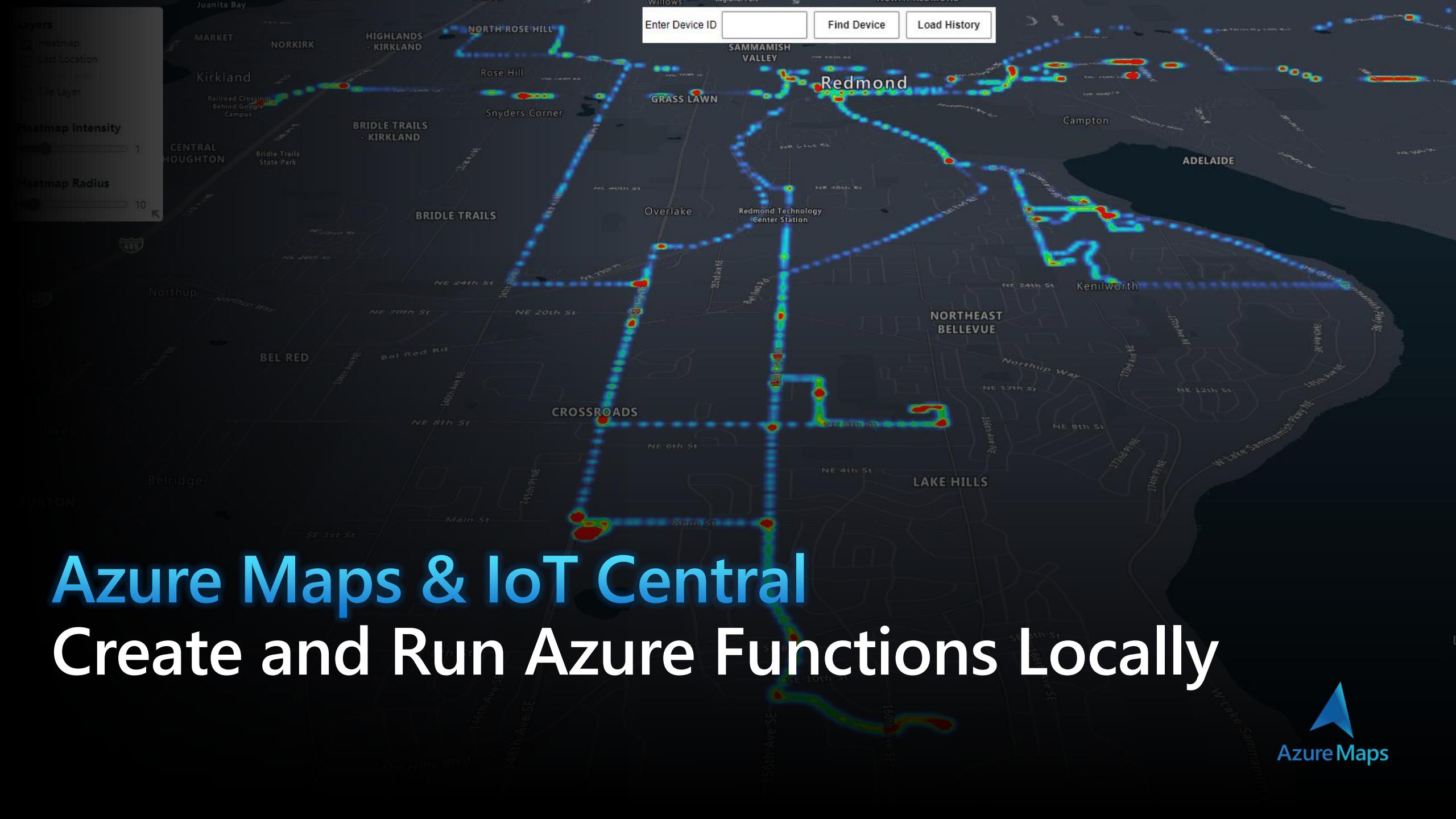
Monitor

Advisor

Microsoft Defender for Cloud

Cost Management + Billing

Help + support



Layers

- Heatmap
- Last Location
- Image Layer
- Tile Layer

Heatmap Intensity

Heatmap Radius

Enter Device ID Find Device Load History



```
PS C:\Users\jokebeck\source\repos> mkdir AzM_Web_PubSub_Demo
```

```
Directory: C:\Users\jokebeck\source\repos
```

Mode	LastWriteTime	Length	Name
d----	6/13/2022 6:13 PM		AzM_Web_PubSub_Demo

```
PS C:\Users\jokebeck\source\repos> cd .\AzM_Web_PubSub_Demo\
```

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> |
```

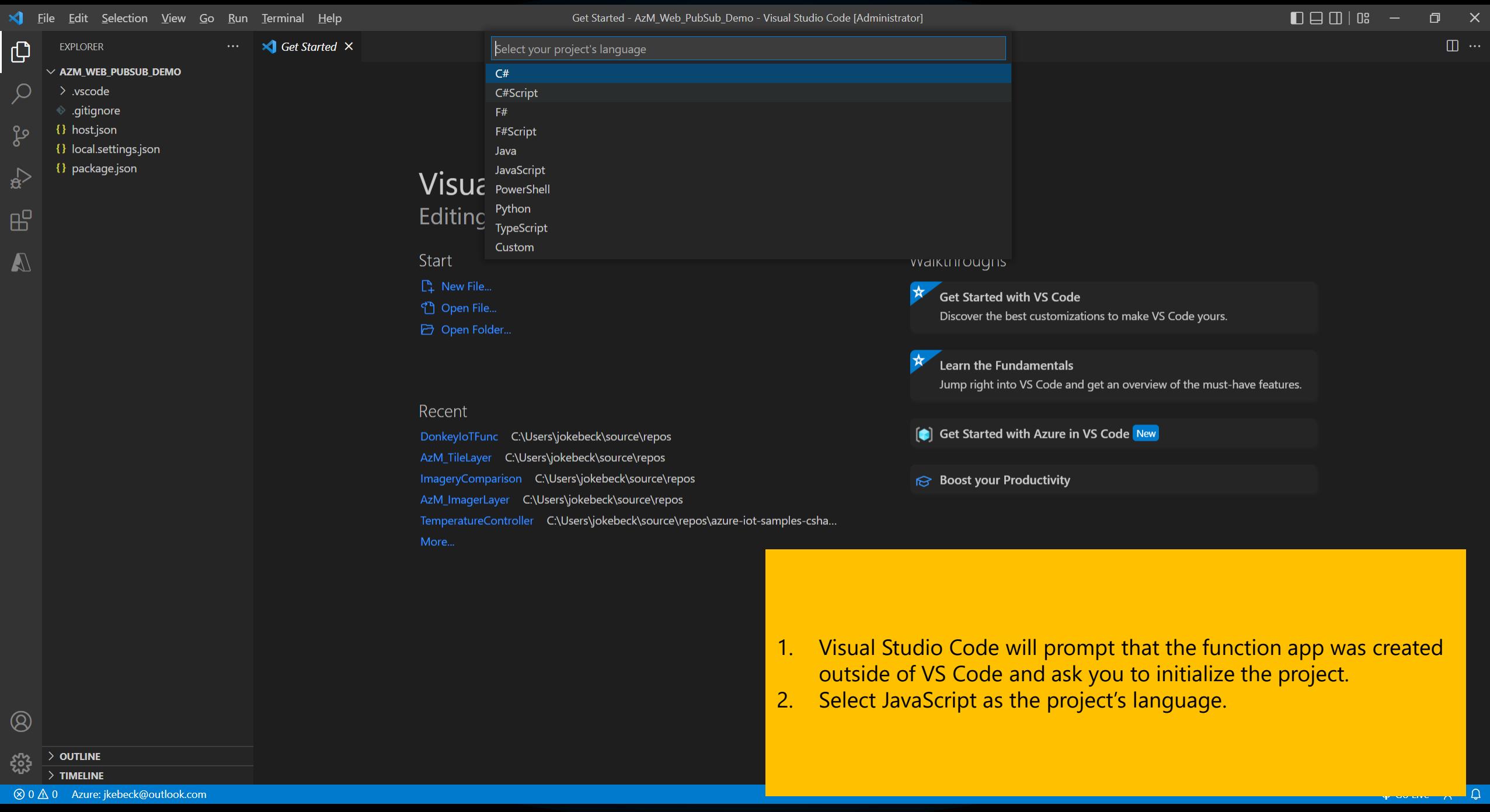
A good step by step guide to start for Azure Functions connected to Azure Web PubSub is "[Create a serverless notification app with Azure Functions and Azure Web PubSub service](#)". Let's start with this tutorial and then modify the code to meet our requirements.

1. Create a new folder for your Azure Function project.
2. Change into the new directory.



```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func init --worker-runtime javascript
Writing package.json
Writing .gitignore
Writing host.json
Writing local.settings.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\.vscode\extensions.json
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> code .
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> |
```

1. Run the command: `func init --worker-runtime javascript`
2. Open Visual Studio Code in this directory.



File Edit Selection View Go Run Terminal Help host.json - AzM_Web_PubSub_Demo - VS Code

EXPLORER ... host.json X

AZM_WEB_PUBSUB_DEMO .vscode .gitignore host.json local.settings.json package.json

host.json > version

```
1 [ {  
2   "version": "2.0"  
3 } ]
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PowerShell 7.2.4
Copyright (c) Microsoft Corporation.

<https://aka.ms/powershell>
Type 'help' to get help.

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>

Modify the host.json file:

```
{  
  "version": "2.0"  
}
```

① 0 △ 0 Azure: jokebeck@outlook.com

The screenshot shows the Azure Functions extension in Visual Studio Code. The Explorer sidebar on the left lists files in the 'AZM_WEB_PUBSUB_DEMO' folder, including 'host.json', which is currently selected. The 'host.json' file content is displayed in the center editor area:

```
1 {  
2   "version": "2.0"  
3 }
```

A yellow callout box on the right provides instructions:

1. Open the terminal...
2. ... and install the extension package

The terminal at the bottom shows the command being run:

```
func extensions install --package  
Microsoft.Azure.WebJobs.Extensions.WebPubSub --version 1.1.0
```

A status bar at the bottom right indicates 'Johannes Kebeck (jokebeck@microsoft.com) is signed in'.

The terminal output shows the PowerShell session starting with 'PowerShell 7.2.4' and 'Copyright (c) Microsoft Corporation.' It then runs the command 'func extensions install --package Microsoft.Azure.WebJobs.Extensions.WebPubSub --version 1.1.0'. The output details the restoration of the package reference in the 'extensions.csproj' file.

```
PowerShell 7.2.4  
Copyright (c) Microsoft Corporation.  
  
https://aka.ms/powershell  
Type 'help' to get help.  
  
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func extensions install --package Microsoft.Azure.WebJobs.Extensions.WebPubSub --version 1.1.0  
Determining projects to restore...  
Writing C:\Users\jokebeck\AppData\Local\Temp\tmp78D3.tmp  
info : Adding PackageReference for package 'Microsoft.Azure.WebJobs.Extensions.WebPubSub' into project 'C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\extensions.csproj'.  
info : Restoring packages for C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\extensions.csproj...  
info : Package 'Microsoft.Azure.WebJobs.Extensions.WebPubSub' is compatible with all the specified frameworks in project 'C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\extensions.csproj'.  
info : PackageReference for package 'Microsoft.Azure.WebJobs.Extensions.WebPubSub' version '1.1.0' added to file 'C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\extensions.csproj'.  
info : Generating MSBuild file C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\obj\extensions.csproj.nuget.g.props.  
info : Generating MSBuild file C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\obj\extensions.csproj.nuget.g.targets.  
info : Writing assets file to disk. Path: C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\obj\project.assets.json  
log : Restored C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\extensions.csproj (in 660 ms).
```

Bottom status bar: Ln 2, Col 19 Spaces: 2 UTF-8 CRLF {} JSON Go Live

The screenshot shows the Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Explorer:** Shows the project structure under AZM_WEB_PUBSUB_DEMO, including .vscode, bin, index, obj, .gitignore, extensions.csproj, host.json (selected), local.settings.json, and package.json.
- Terminal:** The terminal window displays the command `func new -n index -t HttpTrigger` being run in a PowerShell session (pwsh). The output shows the creation of a new function named "index" using the "HttpTrigger" template, writing files to C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index and C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index\function.json, and confirming successful creation.
- Code Editor:** The host.json file is open, showing its contents:

```
1 {  
2   "version": "2.0"  
3 }
```
- Info Bar:** A yellow callout box provides instructions: "Create an index function to read and host a static web page for clients." followed by the command `func new -n index -t HttpTrigger`.
- Bottom Status Bar:** Shows file counts (0), user (Azure: jokebeck@outlook.com), and terminal status (Ln 3, Col 2, Spaces: 2, UTF-8, CRLF, {}, JSON, Go Live).

File Edit Selection View Go Run Terminal Help function.json - AzM_Web_PubSub_Demo

EXPLORER ... host.json function.json

AZM_WEB_PUBSUB_DEMO .vscode bin index function.json index.js obj .gitignore extensions.csproj host.json local.settings.json package.json

index > function.json

```
1 [ "bindings": [ { "authLevel": "anonymous", "type": "httpTrigger", "direction": "in", "name": "req", "methods": [ "get", "post" ] }, { "type": "http", "direction": "out", "name": "res" } ] }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n index -t H
Use the up/down arrow keys to select a template:HttpTrigger
Function name: [HttpTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index\function.json
The function "index" was created successfully from the "HttpTrigger" template
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

Update index/function.json as follows:

```
{ "bindings": [ { "authLevel": "anonymous", "type": "httpTrigger", "direction": "in", "name": "req", "methods": [ "get", "post" ] }, { "type": "http", "direction": "out", "name": "res" } ] }
```

File Edit Selection View Go Run Terminal Help index.js - AzM_Web_PubSub_Demo - Vis...

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > .vscode
- > bin
- < index
 - {} function.json
 - js index.js
- > obj
- ↳ .gitignore
- ↳ extensions.csproj
- {} host.json
- {} local.settings.json
- {} package.json

index > JS index.js > index.js > exports > fs.readFile('utf8') callback

```
1  var path = require('path');
2
3  module.exports = function (context, req) {
4      var index = 'index.html';
5      if (process.env["HOME"] != null)
6      {
7          index = path.join(process.env["HOME"], "site", "wwwroot", index);
8      }
9      context.log("index.html path: " + index);
10     fs.readFile(index, 'utf8', function (err, data) {
11         if (err) {
12             console.log(err);
13             context.done(err);
14         }
15         context.res = {
16             status: 200,
17             headers: {
18                 'Content-Type': 'text/html'
19             },
20             body: data
21         };
22         context.done();
23     });
24 };
25 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n index -t HttpTrigger
Use the up/down arrow keys to select a template:HttpTrigger
Function name: [HttpTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\index\host.json
The function "index" was created successfully from the "HttpTrigger" template
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> 
```

Update index/index.js as follows:

```
var fs = require('fs');
var path = require('path');

module.exports = function (context, req) {
    var index = 'index.html';
    if (process.env["HOME"] != null)
    {
        index = path.join(process.env["HOME"], "site", "wwwroot", index);
    }
    context.log("index.html path: " + index);
    fs.readFile(index, 'utf8', function (err, data) {
        if (err) {
            console.log(err);
            context.done(err);
        }
        context.res = {
            status: 200,
            headers: {
                'Content-Type': 'text/html'
            },
            body: data
        };
        context.done();
    });
}
```

EN 12, CPU 1% Spaces: 1 SW 3 GREL (JavaScript) SS LIVE 🔍

A screenshot of the Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar shows "index.js - AzM_Web_PubSub_Demo - Vis". The left sidebar has icons for Explorer, Search, Open, and others, with "AZM_WEB_PUBSUB_DEMO" expanded to show files like .vscode, bin, index, function.json, index.js, negotiate, obj, .gitignore, extensions.csproj, host.json, local.settings.json, and package.json. The main editor area shows the content of index.js. A yellow callout box is positioned over the right side of the editor, containing the text "Create a negotiate function to help clients get service connection url with access token." Below the editor, the bottom navigation bar includes PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and AZURE. The terminal tab is active, showing command-line output:

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n negotiate -t HttpTrigger
Use the up/down arrow keys to select a template:HttpTrigger
Function name: [HttpTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\index.js
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\function.json
The function "negotiate" was created successfully from the "HttpTrigger" template.
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

The status bar at the bottom shows "Ln 12, Col 19" and other details like "Spaces: 4", "UTF-8", "CRLF", and "JavaScript".

File Edit Selection View Go Run Terminal Help function.json - AzM_Web_PubSub_Demo

EXPLORER ... host.json function.json index.js index.js function.json negotiate x

AZM_WEB_PUBSUB_DEMO .vscode bin index function.json index.js negotiate function.json index.js obj .gitignore extensions.csproj host.json local.settings.json package.json

negotiate > function.json > ...

```
1 [ "bindings": [ 2 { 3 "authLevel": "anonymous", 4 "type": "httpTrigger", 5 "direction": "in", 6 "name": "req" 7 }, 8 { 9 "type": "http", 10 "direction": "out", 11 "name": "res" 12 }, 13 { 14 "type": "webPubSubConnection", 15 "name": "connection", 16 "hub": "notification", 17 "direction": "in" 18 } ] ]
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n negotiate
Use the up/down arrow keys to select a template:HttpTrigger
Function name: [HttpTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\function.json
The function "negotiate" was created successfully from the "HttpTrigger" template
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> 
```

Update negotiate/function.json as follows:

```
{ "bindings": [ { "authLevel": "anonymous", "type": "httpTrigger", "direction": "in", "name": "req" }, { "type": "http", "direction": "out", "name": "res" }, { "type": "webPubSubConnection", "name": "connection", "hub": "notification", "direction": "in" } ] }
```

File Edit Selection View Go Run Terminal Help index.js - AzM_Web_PubSub_Demo - Vis...

EXPLORER ... host.json function.json index index.js index function.json negotiate

AZM_WEB_PUBSUB_DEMO .vscode bin index index.js function.json negotiate obj .gitignore extensions.csproj host.json local.settings.json package.json

negotiate > index.js > ...

```
1 module.exports = function (context, req, connection) {  
2   context.res = { body: connection };  
3   context.done();  
4 };
```

Update negotiate/index.js as follows:

```
module.exports = function (context, req, connection) {  
  context.res = { body: connection };  
  context.done();  
};
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n negotiate  
Use the up/down arrow keys to select a template:HttpTrigger  
Function name: [HttpTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\function.json  
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\negotiate\function.js  
The function "negotiate" was created successfully from the "HttpTrigger" template  
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> []
```

< OUTLINE > TIMELINE

0 △ 0 Azure: jokebeck@outlook.com

EN 4, L0 5 Spaces: 4 SW 3 GREL (JavaScript) SS LIVE 🔍

The screenshot shows the Microsoft Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** index.js - AzM_Web_PubSub_Demo - Vis
- Explorer Bar (Left):** Shows the project structure under AZM_WEB_PUBSUB_DEMO, including .vscode, bin, index, negotiate, notification, obj, .gitignore, extensions.csproj, host.json, local.settings.json, and package.json.
- Code Editor (Top Right):** Displays the contents of index.js (negotiate function) and function.json (negotiate).
- Terminal (Bottom):** Shows the command `func new -n notification -t TimerTrigger` being run in the terminal, followed by the output of the function creation process.
- Right Panel (Yellow Box):** A yellow callout box contains the text: "Create a notification function to help clients get service connection url with access token." and the command "func new -n notification -t TimerTrigger".

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification -t TimerTrigger
Use the up/down arrow keys to select a template:TimerTrigger
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\index.js
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\readme.md
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\function.json
The function "notification" was created successfully from the "TimerTrigger" template.
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

Bottom status bar: Ln 4, Col 3 Spaces: 4 UTF-8 CRLF {} JavaScript ⚡ Go Live 🔍

File Edit Selection View Go Run Terminal Help function.json - AzM_Web_PubSub_Demo

EXPLORER ... host.json function.json index index.js function.json negotiate

AZM_WEB_PUBSUB_DEMO .vscode bin index function.json index.js negotiate function.json index.js notification function.json index.js readme.md obj .gitignore extensions.csproj host.json local.settings.json package.json

notification > function.json > ...

```
1 [ "bindings": [
2   {
3     "name": "myTimer",
4     "type": "timerTrigger",
5     "direction": "in",
6     "schedule": "*/10 * * * *"
7   },
8   {
9     "type": "webPubSub",
10    "name": "actions",
11    "hub": "notification",
12    "direction": "out"
13  }
14]
15]
16 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification
Use the up/down arrow keys to select a template:TimerTrigger
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\readme.md
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\function\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\function\index.js
The function "notification" was created successfully from the "TimerTrigger"
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> 
```

Update notification/function.json as follows:

```
{
  "bindings": [
    {
      "name": "myTimer",
      "type": "timerTrigger",
      "direction": "in",
      "schedule": "*/10 * * * *"
    },
    {
      "type": "webPubSub",
      "name": "actions",
      "hub": "notification",
      "direction": "out"
    }
  ]
}
```

0 △ 0 Azure: jokebeck@outlook.com

File Edit Selection View Go Run Terminal Help index.js - AzM_Web_PubSub_Demo - V

EXPLORER ... host.json function.json index index.js index function.json negotiate

AZM_WEB_PUBSUB_DEMO .vscode bin index function.json index.js negotiate function.json index.js notification function.json index.js

notification > index.js > getValue

```
1 module.exports = function (context, myTimer) {  
2     context.bindings.actions = [  
3         "actionName": "sendToAll",  
4         "data": `[DateTime: ${new Date()}] Temperature: ${getValue(22, 1)}\xB0C, Humidity: ${getValue(40, 2)}%`,  
5         "dataType": "text"  
6     ]  
7     context.done();  
8 }  
9  
10 function getValue(baseNum, floatNum) {  
11     return (baseNum + 2 * floatNum * (Math.random() - 0.5)).toFixed(3);  
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification  
Use the up/down arrow keys to select a template: TimerTrigger  
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\readme.md  
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\index.js  
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\function.json  
The function "notification" was created successfully from the "TimerTrigger"  
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> 
```

Update notification/index.js as follows:

```
module.exports = function (context, myTimer) {  
    context.bindings.actions = [  
        "actionName": "sendToAll",  
        "data": `[DateTime: ${new Date()}] Temperature: ${getValue(22, 1)}\xB0C, Humidity: ${getValue(40, 2)}%`,  
        "dataType": "text"  
    ]  
    context.done();  
};  
  
function getValue(baseNum, floatNum) {  
    return (baseNum + 2 * floatNum * (Math.random() - 0.5)).toFixed(3);  
}
```

OUTLINE
TIMELINE

0 △ 0 Azure: jokebeck@outlook.com

The screenshot shows the Visual Studio Code interface with the following details:

- Explorer View:** Shows the project structure under `AZM_WEB_PUBSUB_DEMO`, including files like `host.json`, `function.json`, `index.js`, `negotiate.js`, `notification.js`, `index.html`, `readme.md`, `.gitignore`, `extensions.csproj`, and `local.settings.json`.
- Editor View:** The `index.html` file is open, displaying an HTML page with an Azure Web PubSub notification header and a script block that handles message reception via a WebSocket.
- Terminal View:** A PowerShell window (pwsh) is active, showing the command `func new -n notification -t TimerTrigger` being run, followed by the creation of function files in the `notification` folder.

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification -t TimerTrigger
Use the up/down arrow keys to select a template:TimerTrigger
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\index.js
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\readme.md
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\notification\function.json
The function "notification" was created successfully from the "TimerTrigger" template.
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> []
```

File Edit Selection View Go Run Terminal Help index.js - AzM_Web_PubSub_Demo - V

EXPLORER ... host.json function.json index index.js function.json negotiate

AZM_WEB_PUBSUB_DEMO notification > index.js > getValue

```
1 module.exports = function (context, myTimer) {  
2     context.bindings.actions = [  
3         "actionName": "sendToAll",  
4         "data": `[DateTime: ${new Date()}] Temperature: ${getValue()}`,  
5         "dataType": "text"  
6     ];  
7     context.done();  
8 };  
9  
10 function getValue(baseNum, floatNum) {  
11     return (baseNum + 2 * floatNum * (Math.random() - 0.5)).toFixed(2);  
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification  
Use the up/down arrow keys to select a template: TimerTrigger  
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n notification  
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n negotiate  
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n index  
The function "notification" was created successfully from the "TimerTrigger" template  
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> 
```

Add the client single page index.html in the project root folder and copy content as below.

```
<html>  
<body>  
<h1>Azure Web PubSub Notification</h1>  
<div id="messages"></div>  
<script>  
    (async function () {  
        let messages = document.querySelector('#messages');  
        let res = await fetch(`${window.location.origin}/api/negotiate`);  
        let url = await res.json();  
        let ws = new WebSocket(url.url);  
        ws.onopen = () => console.log('connected');  
  
        ws.onmessage = event => {  
            let m = document.createElement('p');  
            m.innerText = event.data;  
            messages.appendChild(m);  
        };  
    })();  
</script>  
</body>  
</html>
```

0 △ 0 Azure: jokebeck@outlook.com

azure-maps-demos - Microsoft Edge

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/re

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+ /)

Home > Resource groups > IOTC > azure-maps-demos

azure-maps-demos | Keys

Web PubSub Service

Save Discard

Search (Ctrl + /) Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Host name: `azure-maps-demos.webpubsub.azure.com`

Access Key: Primary Key: `W3tqA1DQ469jNz67pV2Mk81Hg5d01190W7...` Connection string: `https://azur...`

Enable Disable

Regenerate Primary Key

Secondary Key: `W3tqA1DQ469jNz67pV2Mk81Hg5d01190W7...` Connection string: `https://azur...`

Regenerate Secondary Key

Monitoring: Alerts, Metrics, Diagnostic settings, Live trace settings

Automation: Tasks (preview), Export template

Client URL Generator: Hub, User ID, Token Lifetime (Minutes): 60, Select Sign Key: Primary (selected), Secondary

Support + troubleshooting: New Support Request, Roles, Send to GitHub, Help & Docs

Retrieve the connection string for the Azure Web PubSub service from the Azure Portal.

The screenshot shows the 'Keys' page for an Azure Web PubSub service named 'azure-maps-demos'. The 'Primary' key is selected, displaying its value and a copy button. Below it, the 'Secondary' key is also listed with its value and a copy button. The 'Connection string' for each key is provided as a long URL. The 'Client URL Generator' section at the bottom allows generating URLs for specific hubs and user IDs with token lifetimes of 60 minutes, using either the primary or secondary key. The left sidebar lists various Azure services like App Services, Function App, and Storage accounts.

File Edit Selection View Go Run Terminal Help index.html - AzM_Web_PubSub_Demo - V

EXPLORER ... host.json function.json index index.js index function.json negotiate

AZM_WEB_PUBSUB_DEMO .vscode bin index function.json index.js negotiate function.json index.js notification function.json index.js readme.md obj .gitignore extensions.csproj host.json index.html local.settings.json package.json

index.html > html

```
<html>
  <body>
    <h1>Azure Web PubSub Notification</h1>
    <div id="messages"></div>
    <script>
      (async function () {
        let messages = document.querySelector('#messages');
        let res = await fetch(` ${window.location.origin}/api/negotiate`);
        let url = await res.json();
        let ws = new WebSocket(url.url);
        ws.onopen = () => console.log('connected');

        ws.onmessage = event => {
          let m = document.createElement('p');
          m.innerText = event.data;
          messages.appendChild(m);
        };
      })();
    </script>
  </body>
</html>
```

Run the command below to add the Azure Web PubSub connection string to the Azure function.

```
func settings add WebPubSubConnectionString "<connection-string>"
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE pwsh + □ ×

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func settings add WebPubSubConnectionString "Endpoint=https://azure-maps-demos.webpubsub.azure.com;AccessKey=a0/LWabnMBmMFqcZ2I/DMA+95v/fAoRpV4NmU94Fzao=;Version=1.0;"
```

OUTLINE
TIMELINE

0 △ 0 Azure: jokebeck@outlook.com Ln 21, Col 8 Spaces: 4 UTF-8 CRLF HTML Go Live

EXPLORER ... son function.json index JS index.js index function.json negotiate JS index.js negotiate function.json notification JS index.js notification index.html local.settings.json ...

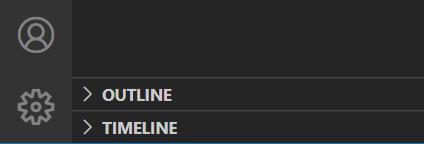
AZM_WEB_PUBSUB_DEMO

- > .vscode
- > bin
- < index
 - { function.json
 - JS index.js
- < negotiate
 - { function.json
 - JS index.js
- < notification
 - { function.json
 - JS index.js
- > obj
- ↳ .gitignore
- ↳ extensions.csproj
- { host.json
- ↳ index.html
- { local.settings.json
- { package.json

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE pwsh + ^ x

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func settings add WebPubSubConnectionString "Endpoint=https://azure-maps-demos.webpubsub.azure.com;AccessKey=a0/LWabnMBmMFqcZ2I/DMA+95v/fAoRpV4NmU94Fzao=;Version=1.0;"  
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

The connection string is added to the local.settings.json.



File Edit Selection View Go Run Terminal Help

local.settings.json - AzM_Web_PubSub_Demo

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > .vscode
- > bin
- index
 - { } function.json
 - JS index.js
- negotiate
 - { } function.json
 - JS index.js
- notification
 - { } function.json
 - JS index.js
- obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- { } local.settings.json
- { } package.json

1. Run the function with the following command:
func start
2. Open the web page at https://localhost:7071/api/index

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func start

Azure Functions Core Tools
Core Tools Version: 4.0.4590 Commit hash: N/A (64-bit)
Function Runtime Version: 4.5.2.18383

Functions:

index: [GET,POST] http://localhost:7071/api/index
negotiate: http://localhost:7071/api/negotiate
notification: timerTrigger

For detailed output, run func with --verbose flag.
[2022-06-14T02:26:28.983Z] Worker process started and initialized.
[2022-06-14T02:26:30.058Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-13T19:26:30.0296892-07:00', Id=7d01b446-1af1-4fec-a377-0970436861dc)

Ln 5, Col 55 Spaces: 2 UTF-8 CRLF {} JSON ⚡ Go Live 🔍

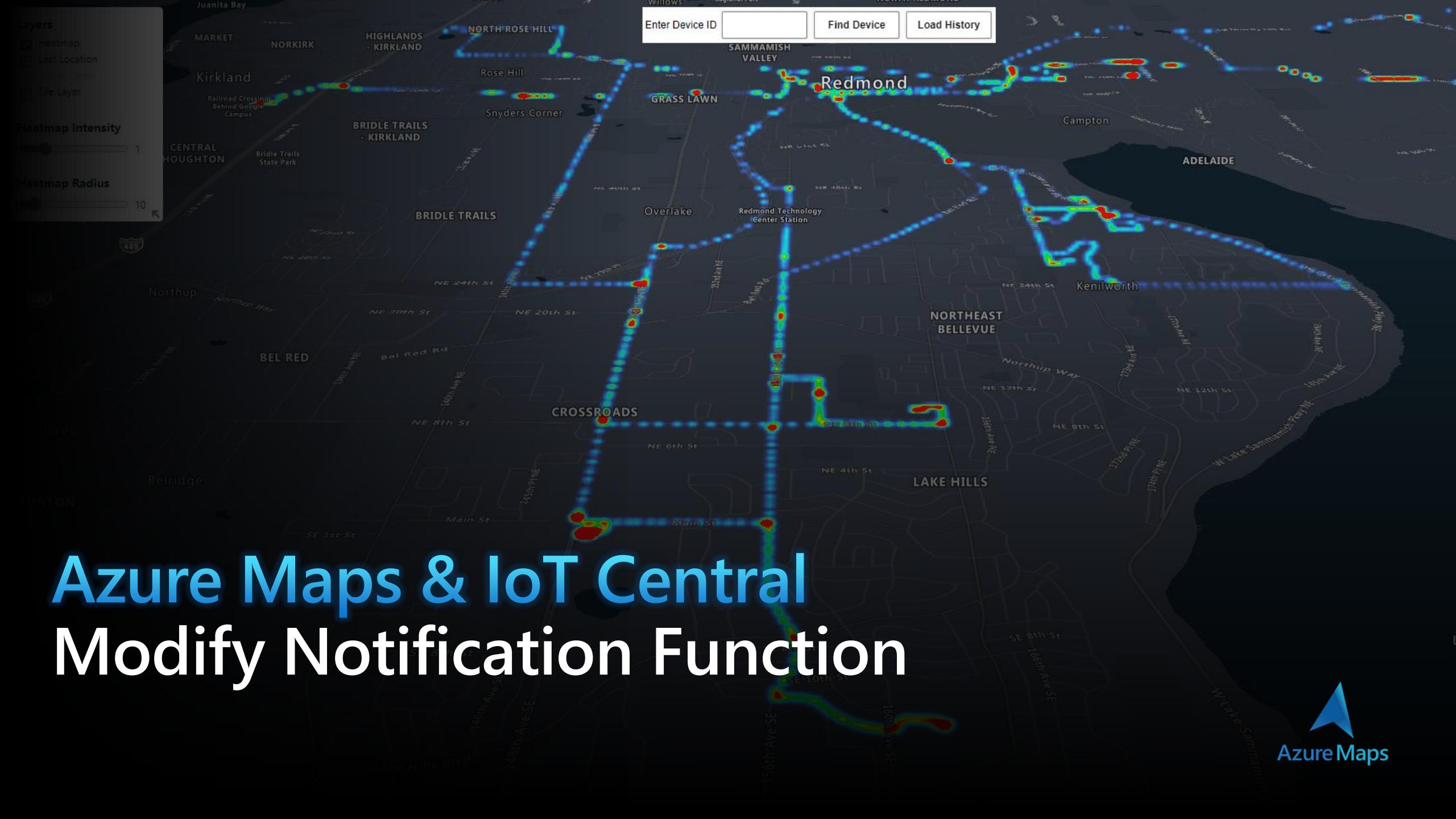
Home | Azure | Tutorial - Create | localhost:7071/ | azure function | c# - The listener | The listener for ...

localhost:7071/api/index

Azure Web PubSub Notification

```
[DateTime: Mon Jun 13 2022 19:26:40 GMT-0700 (Pacific Daylight Time)] Temperature: 21.723°C, Humidity: 41.669%
[DateTime: Mon Jun 13 2022 19:26:50 GMT-0700 (Pacific Daylight Time)] Temperature: 21.946°C, Humidity: 38.128%
[DateTime: Mon Jun 13 2022 19:27:00 GMT-0700 (Pacific Daylight Time)] Temperature: 21.776°C, Humidity: 41.545%
[DateTime: Mon Jun 13 2022 19:27:10 GMT-0700 (Pacific Daylight Time)] Temperature: 21.756°C, Humidity: 39.150%
[DateTime: Mon Jun 13 2022 19:27:20 GMT-0700 (Pacific Daylight Time)] Temperature: 22.678°C, Humidity: 40.556%
```

1. You will see timer-triggered notifications in the browser.



Azure Maps

File Edit Selection View Go Run Terminal Help

function.json - AzM_Web_PubS...

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- > index
- > negotiate
- notification
- function.json
- index.js
- readme.md
- > obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

notification > function.json > ...

```
1  {
2    "bindings": [
3      {
4        "authLevel": "anonymous",
5        "type": "httpTrigger",
6        "direction": "in",
7        "name": "req",
8        "methods": [
9          "get",
10         "post"
11       ],
12     },
13     {
14       "type": "webPubSub",
15       "name": "actions",
16       "hub": "notification",
17       "direction": "out"
18     }
19   ]
20 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
[2022-06-14T12:35:50.016Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:35:50.016Z')
[2022-06-14T12:35:50.164Z] Executed 'Functions.notification' (Succeeded, Id=e6e63d67-97b2-436
[2022-06-14T12:36:00.008Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:36:00.008Z')
[2022-06-14T12:36:00.170Z] Executed 'Functions.notification' (Succeeded, Id=8c6951e8-2d79-4ee
[2022-06-14T12:36:10.014Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:36:10.014Z')
[2022-06-14T12:36:10.158Z] Executed 'Functions.notification' (Succeeded, Id=db5d983a-b526-461
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

Session contents restored from 6/14/2022 at 11:16:18 AM

PowerShell 7.2.4
Copyright (c) Microsoft Corporation.

<https://aka.ms/powershell>
Type 'help' to get help.

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>

0 ▲ 0 AzM_Web_PubSub_Demo Azure:jkebeck@outlook.com

Modify notification/function.json to replace the timerTrigger with an httpTrigger. You will invoke this trigger through a WebHook from IoT Central.

```
{
  "bindings": [
    {
      "authLevel": "anonymous",
      "type": "httpTrigger",
      "direction": "in",
      "name": "req",
      "methods": [
        "get",
        "post"
      ]
    },
    {
      "type": "webPubSub",
      "name": "actions",
      "hub": "notification",
      "direction": "out"
    }
  ]
}
```

```
File Edit Selection View Go Run Terminal Help
index.js - AzM_Web_PubSub_Demo
EXPLORER
AZM_WEB_PUBSUB_DEMO
> vscode
> bin
> index
> negotiate
notification
function.json
index.js
readme.md
obj
.gitignore
extensions.csproj
host.json
index.html
local.settings.json
package.json

index.js  x  function.json
notification > index.js > <unknown> > exports
1 module.exports = function (context, req) {
2   context.log('Node.js HTTP trigger function processed a request. RequestUri=%s', req.originalUrl);
3
4   if (req.body) {
5     console.log('Request Body: ' + JSON.stringify(req.body));
6     //
7     // sample message:
8     //
9     //   "deviceId": "2ijbfmawbtc",
10    //   "enqueuedTime": "2022-05-22T21:25:58.577Z",
11    //   "telemetry": {
12    //     "geolocation": {
13    //       "alt": 144.09999084472656,
14    //       "lat": 47.6710354,
15    //       "lon": -122.0176103
16    //     }
17   }
18   //
19   context.bindings.actions = {
20     "actionName": "sendToAll",
21     "data": `{"DeviceID":"${req.body.deviceId}","Time":"${new Date(req.body.enqueuedTime).toLocaleString()}","Lat":${req.body.telemetry.geolocation.lat}, "Lon":${req.body.telemetry.geolocation.lon}}`,
22     "dataType": "json"
23   }
24
25   context.res = {
26     body: "Done"
27   };
28
29   context.done();
30
31 }

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

[2022-06-14T12:35:50.016Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:35:50.016Z')
[2022-06-14T12:35:50.164Z] Executed 'Functions.notification' (Succeeded, Id=e6e63d67-97b2-4363-b
[2022-06-14T12:36:00.008Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:36:00.008Z')
[2022-06-14T12:36:00.170Z] Executed 'Functions.notification' (Succeeded, Id=8c6951e8-2d79-4eed-8
[2022-06-14T12:36:10.014Z] Executing 'Functions.notification' (Reason='Timer fired at 2022-06-14T12:36:10.014Z')
[2022-06-14T12:36:10.158Z] Executed 'Functions.notification' (Succeeded, Id=db5d983a-b526-461e-b
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>

Session contents restored from 6/14/2022 at 11:16:18 AM

PowerShell 7.2.4
Copyright (c) Microsoft Corporation.

https://aka.ms/powershell
Type 'help' to get help.

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>
```

Modify notification/index.js to process a message received from IoT Central and send it to Azure We PubSub:

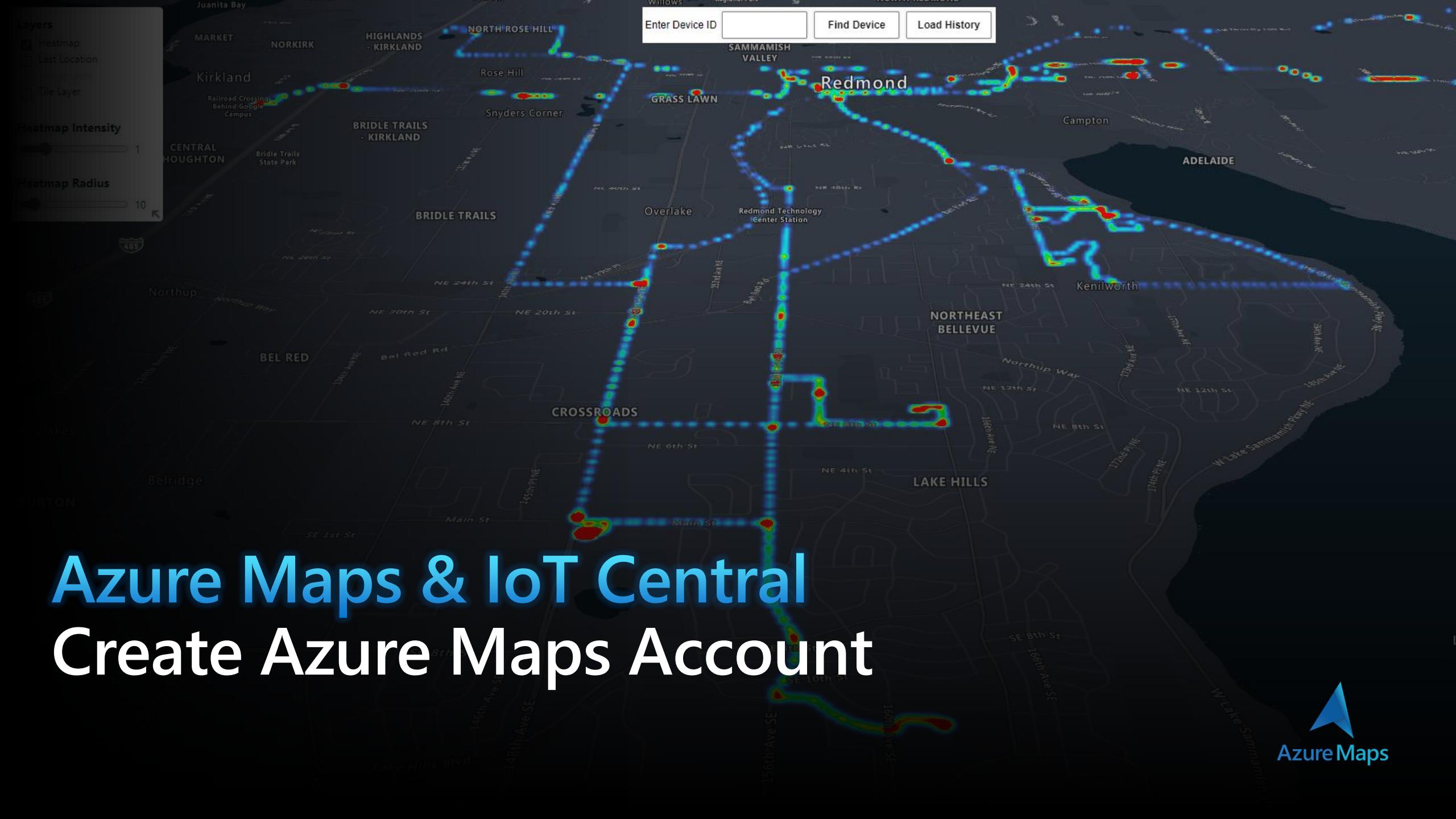
```
module.exports = function (context, req) {
  context.log('Node.js HTTP trigger function processed a request. RequestUri=%s', req.originalUrl);

  if (req.body) {
    console.log('Request Body: ' + JSON.stringify(req.body));
    context.bindings.actions = {
      "actionName": "sendToAll",
      "data": `{"DeviceID":"${req.body.deviceId}","Time":"${new Date(req.body.enqueuedTime).toLocaleString()}","Lat":${req.body.telemetry.geolocation.lat}, "Lon":${req.body.telemetry.geolocation.lon}}`,
      "dataType": "json"
    }
  }

  context.res = {
    body: "Done"
  };

  context.done();
}

else {
  context.res = {
    status: 400,
    body: "Please pass a valid JSON object in the request body"
  };
}
```



Azure Subscription Library | Tutorial - Create a serverless noti | IOTC - Microsoft Azure | https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/resourceGroups/IOTC/overview

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Home > Resource groups >

Resource groups

IOTC Resource group

Create | Manage view | ...

Search (Ctrl+/)

Overview

+ Create | Manage view | Delete resource group | Refresh | Export to CSV | Open query | Assign tags | Move | Delete | View Cost | JSON View

Essentials

Subscription (move) : Azure Maps - SubLib - Loan05 Deployments : 1 Succeeded
Subscription ID : 2aa49947-b38a-4a9c-957b-8c551c321ba8 Location : East US
Tags (edit) : Env : NonProd

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 2 of 2 records. Show hidden types

No grouping List view

Name	Type	Location
azure-maps-demos	IoT Central Application	East US
azure-maps-demos	Web PubSub Service	East US

Cost Management

Cost analysis Cost alerts (preview) Budgets Advisor recommendations

Monitoring

Insights (preview) Alerts Metrics Diagnostic settings Logs Advisor recommendations

< Previous Page 1 of 1 >

1. In the Azure Portal navigate to the resource group with IoT Central and the Azure Web PubSub service.
2. Click on [Create] to create a new resource

Azure Subscription Library | Tutorial - Create a serverless noti | Create a resource - Microsoft Az | +

https://ms.portal.azure.com/#view/Microsoft_Azure_Marketplace/PlusNewBlade/package~/null/additionalConfig~/null/dontDisc

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Create a resource Home Resource groups IOTC Create a resource

Get Started Recently created Categories

Categories

- Virtual machine
- Kubernetes Service
- Azure Cosmos DB
- Function App
- SQL databases
- Azure Cosmos DB
- Virtual machines
- Load balancers
- Storage accounts
- Virtual networks
- Monitor
- Advisor
- Microsoft Defender for Cloud
- Cost Management + Billing
- Help + support

Recently created

Categories

- AI + Machine Learning
- Analytics
- Blockchain
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things
- IT & Management Tools
- Media
- Migration
- Mixed Reality
- Monitoring & Diagnostics
- Networking
- Security
- Storage
- Web

Search results for "azure maps":

Azure Maps

1. Search for Azure Maps

Getting Started? T

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Set up + subscribe | Learn more

Set up + subscribe | Learn more

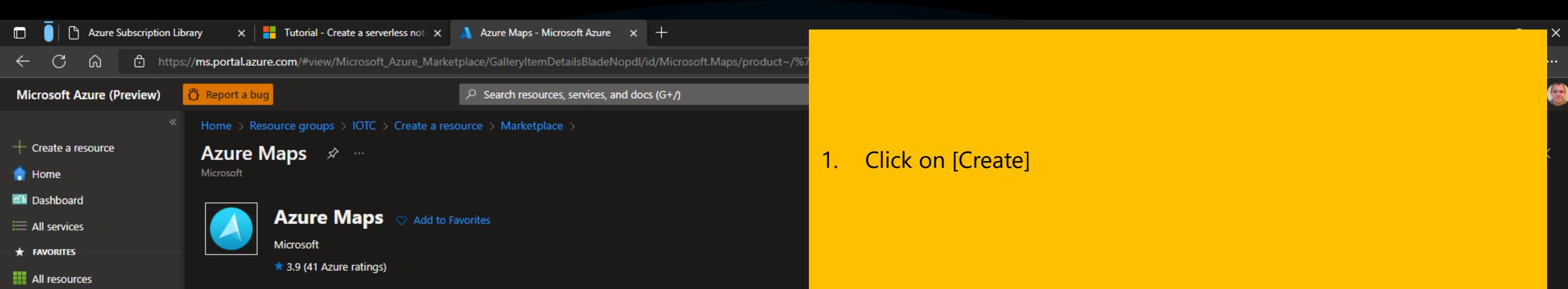
Create | Learn more

Create | Learn more

Create | Learn more

Create | Learn more

Wipro



Microsoft Azure (Preview) [Report a bug](#) [Search resources, services, and docs \(G+ /\)](#)

Home > Resource groups > IOTC > Create a resource > Marketplace >

Azure Maps

Microsoft

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Microsoft
★ 3.9 (41 Azure ratings)

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Azure Maps [Create](#)

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Azure Maps provides developers from all industries, powerful geospatial capabilities, packed with the freshest mapping data available to provide geographic context to web and mobile applications. Azure Maps is an Azure One API compliant set of REST APIs for Maps, Search, Routing, Traffic, Mobility, Time Zones, Geolocation, Geofencing, Map Data, and Spatial Operations accompanied by both Web and Android SDKs to make development easy, flexible, and portable across multiple platforms.

Media



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---	--	---	--

Azure Subscription Library | Tutorial - Create a serverless noti | Create an Azure Maps Account | https://ms.portal.azure.com/#create/MicrosoftMaps

Create an Azure Maps Account resource

Basics Advanced Identities Tags Review + create

Azure Maps is a collection of geospatial services and SDKs that use fresh mapping data to provide geographic context to web and mobile applications. [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

Name * Region * Pricing tier *

[View full pricing details](#)

Terms

Azure Maps shares customer-provided address/location queries ("Queries") with third party TomTom for mapping functionality purposes. Queries are not linked to any customer or end-user when shared with TomTom and cannot be used to identify individuals. Microsoft is currently in the process of adding TomTom to the Online Services Subcontractor List.
[Learn more about Preview](#)

I confirm that I have read and agree to the License and Privacy Statement.

[Review + create](#) < Previous Next : Advanced >

1. Give the resource a name.
2. Pick the same region as you have for the other services.
3. Use the Gen 2 pricing tier
4. Tick the box to acknowledge the license agreement
5. Click [Review + create]

Azure Subscription Library | Tutorial - Create a serverless noti | Create an Azure Maps Account | https://ms.portal.azure.com/#create/MicrosoftMaps

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Validation Passed

Home > Resource groups > IOTC > Create a resource > Marketplace > Azure Maps > Create an Azure Maps Account resource

1. Click [Create]

Review + create

TERMS
By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

Basics

Subscription	Azure Maps - SubLib - Loan05
Resource group	IOTC
Name	azure-maps-demos
Region	East US
Pricing tier	Gen2 (Maps and Location Insights)

Advanced

CORS Domains	0 item(s)
--------------	-----------

Identities

Identity type	None
---------------	------

Create < Previous Next Download a template for automation

Azure Subscription Library | Tutorial - Create a serverless noti | MicrosoftMaps-2022061506350 | Microsoft Azure (Preview) | https://ms.portal.azure.com/#view/HubsExtension/DeploymentDetailsBlade/~/overview/id/%2Fsubscriptions%2F2aa49947-b38a-... | +

Report a bug | Search resources, services, and docs (G+)

Create a resource | Home | Microsoft Maps-20220615063502 | Overview | Deployment | Search (Ctrl+ /) | Delete | Cancel | Redeploy | Refresh | We'd love your feedback! →

Home > Microsoft Maps-20220615063502 | Overview

Deployment

Overview | Inputs | Outputs | Template

Your deployment is complete

Deployment name: MicrosoftMaps-20220615063502
Subscription: Azure Maps - SubLib - Loan05
Resource group: IOTC

Start time: 6/15/2022, 6:35:52 AM
Correlation ID: ad13272b-5c8c-4db4-b50a-cf779dffcd23

Deployment details (Download) | Next steps | Go to resource

Once the deployment is complete...

Resource groups | Create | View

Cost Management | Cost Management | Get notified to stay within your budget and prevent unexpected charges on your bill. Set up cost alerts >

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...navigate to the resource...

Azure Subscription Library | Tutorial - Create a serverless noti | IOTC - Microsoft Azure

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[Resource groups](#)

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[Storage accounts](#)

[Virtual networks](#)

[Monitor](#)

[Advisor](#)

[Microsoft Defender for Cloud](#)

[Cost Management + Billing](#)

[Help + support](#)

[Report a bug](#)

Home > Resource groups >

Resource groups

Microsoft (microsoft.onmicrosoft.com)

[Create](#) [Manage view](#) ...

Filter for any field...

Name	...
cleanupservice	...
IOTC	...

[Overview](#)

Subscription (move) : Azure

Subscription ID : 2aa49947-b38a-4a9c-957b-8c551c321ba8

Tags (edit) : Env : NonProd

[Activity log](#)

[Access control \(IAM\)](#)

[Tags](#)

[Resource visualizer](#)

[Events](#)

[Deployments](#)

[Security](#)

[Policies](#)

[Properties](#)

[Locks](#)

[Cost Management](#)

[Cost analysis](#)

[Cost alerts \(preview\)](#)

[Budgets](#)

[Advisor recommendations](#)

[Monitoring](#)

[Insights \(preview\)](#)

[Alerts](#)

[Metrics](#)

[Diagnostic settings](#)

[Logs](#)

[Advisor recommendations](#)

Resources Recommendations

Showing 1 to 3 of 3 records. Show hidden types ⓘ

No grouping ... List view ...

Name	Type	Location
azure-maps-demos	IoT Central Application	East US
azure-maps-demos	Azure Maps Account	East US
azure-maps-demos	Web PubSub Service	East US

< Previous Page 1 of 1 Next >

Give feedback

Azure Subscription Library | Tutorial - Create a serverless noti | azure-maps-demos - Microsoft | Azure Maps Web PubSub

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/resourceGroups/iotc/providers/Microsoft/Compute/IotHub/azur...| ...

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > azure-maps-demos

azure-maps-demos | CORS

Azure Maps Account

Search (Ctrl + /) Save Discard

Access control (IAM) Tags Diagnose and solve problems Events Settings Creator Authentication Pricing Tier Identity CORS Shared Access Signature Properties Locks Monitoring Alerts Metrics Diagnostic settings Automation Tasks (preview) Export template Support + troubleshooting About New Support Request

Cross-Origin Resource Sharing (CORS) allows JavaScript code running in a browser to access data from a different domain. To allow all origins, use "*" or remove all origins from the list. See the CORS specification for more information.

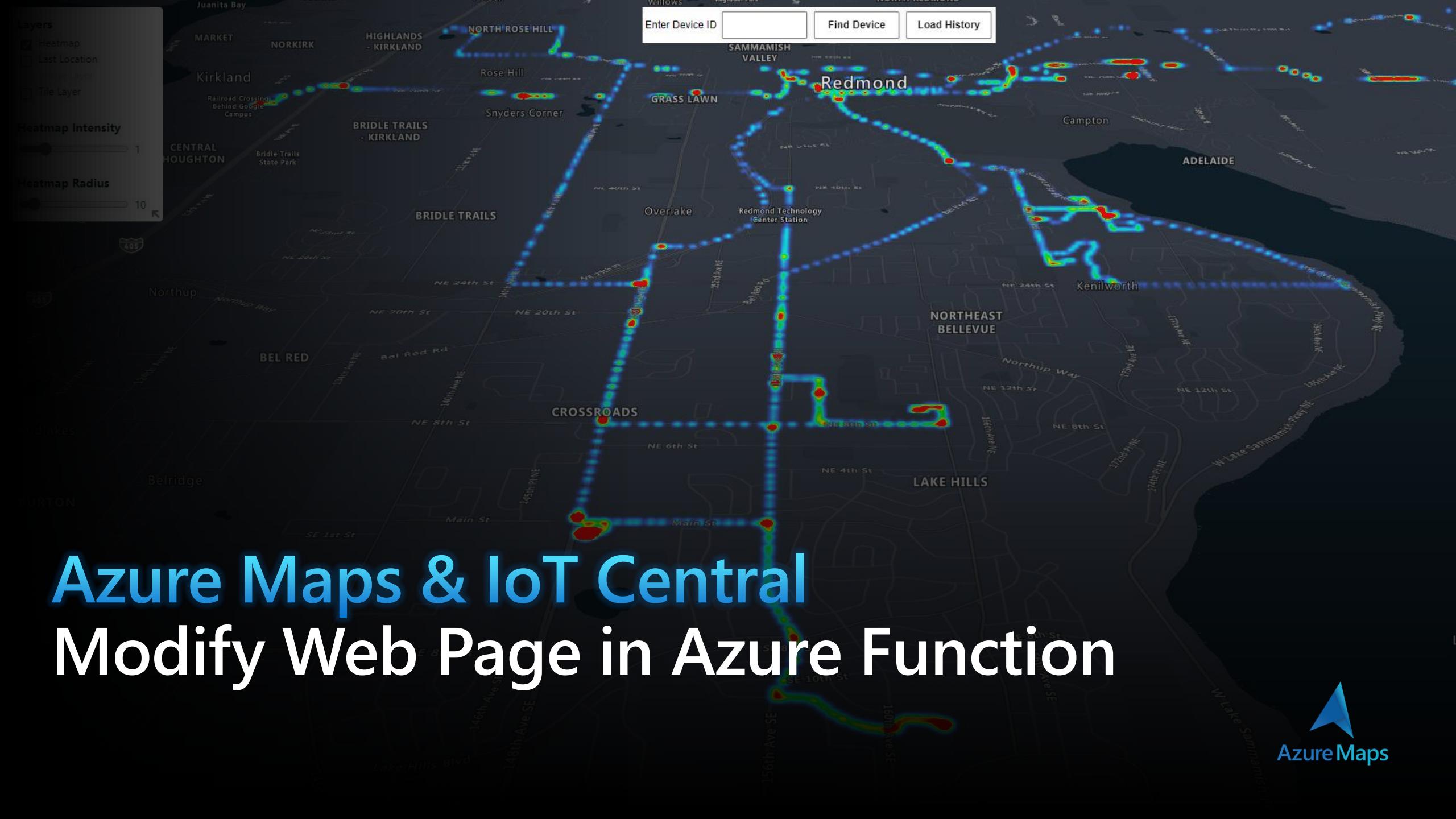
Learn more

Allowed origins

*

http://example.com:12345

...and enable CORS.



File Edit Selection View Go Run Terminal Help

index.html - AzM_Web_PubSub_D...

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- < index
- function.json
- index.js
- > negotiate
- > notification
- > obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

index.html

```
1 <html>
2   <head>
3     <title>Azure Maps Web PubSub</title>
4     <link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/favicon.ico"/>
5     <meta charset="utf-8"/>
6     <meta http-equiv="x-ua-compatible" content="IE=Edge"/>
7     <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no"/>
8     <!-- Load the JavaScript and CSS files for the Azure Maps Web SDK. -->
9     <link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css"/>
10    <script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js"/>
11    <!-- Load the JavaScript and CSS files that has our custom control. -->
12    <link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-control.css"/>
13    <script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-control.js"/>
14
15    <style>...
16    </style>
17  </head>
18  <body onload="InitMap()">
19    <div id="myMap"></div>
20    <div class="controlContainer">...
21    </div>
22
23    <script>
24      // 
25      // Begin Edits
26      //
27      var mapKey = 'YOUR_AZURE_MAPS_KEY';
28      var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
29      //
30      // End Edits
31      //
32      var map;
33      var popup = null;
34      var dsHeatmap = new atlas.source.DataSource();
35      var lHeatmap = null;
36      var dsLastLoc = new atlas.source.DataSource();
37      var lLastLoc = null;
38
39      function InitMap()
40      {
41        map = new atlas.Map('myMap', [
42          center: [-122.33, 47.6],
43          zoom: 12,
44          language: 'en-US',
45          renderWorldCopies: false,
46          showBuildingModels: true,
47          showLogo: true,
48          showFeedbackLink: false,
49          style: 'grayscale-dark'
50        ]);
51
52        map.on('load', () => {
53          map.setControlVisibility('geolocate', true);
54          map.setControlVisibility('zoom', true);
55          map.setControlVisibility('attribution', true);
56        });
57
58        map.on('click', (e) => {
59          if (popup)
60            popup.remove();
61
62          const location = e.getCenter();
63          const address = await atlas.geocoding.reverseGeocode(location);
64
65          if (address.length > 0)
66            map.setCenter(address[0].location);
67
68          const bounds = address[0].location.getBBox('en-US');
69          const boundsString = bounds.getCenter().lat + ', ' + bounds.getCenter().lon + ', ' + bounds.getSouthWest().lat + ', ' + bounds.getSouthWest().lon;
70
71          const popupContent = `
72            <p>Address:</p>
73            <pre>${address[0].address}</pre>
74            <p>Coordinates:</p>
75            <pre>${boundsString}</pre>
76          `;
77
78          const popup = map.create-popup(popupContent);
79          map.setCenter(bounds.getCenter());
80          map.setZoom(15);
81          map.setView([bounds.getCenter().lat, bounds.getCenter().lon], 15);
82
83          map.setControlVisibility('geolocate', false);
84          map.setControlVisibility('zoom', false);
85          map.setControlVisibility('attribution', false);
86        });
87
88        map.on('load', () => {
89          map.setControlVisibility('geolocate', true);
90          map.setControlVisibility('zoom', true);
91          map.setControlVisibility('attribution', true);
92        });
93
94        map.on('click', (e) => {
95          if (popup)
96            popup.remove();
97
98          const location = e.getCenter();
99          const address = await atlas.geocoding.reverseGeocode(location);
100
101         if (address.length > 0)
102           map.setCenter(address[0].location);
103
104         const bounds = address[0].location.getBBox('en-US');
105         const boundsString = bounds.getCenter().lat + ', ' + bounds.getCenter().lon + ', ' + bounds.getSouthWest().lat + ', ' + bounds.getSouthWest().lon;
106
107         const popupContent = `
108           <p>Address:</p>
109           <pre>${address[0].address}</pre>
110           <p>Coordinates:</p>
111           <pre>${boundsString}</pre>
112         `;
113
114         const popup = map.create-popup(popupContent);
115         map.setCenter(bounds.getCenter());
116         map.setZoom(15);
117         map.setView([bounds.getCenter().lat, bounds.getCenter().lon], 15);
118
119         map.setControlVisibility('geolocate', false);
120         map.setControlVisibility('zoom', false);
121         map.setControlVisibility('attribution', false);
122       });
123
124     });
125   

```

1. In VS Code replace the code of the webpage served by the Azure Function (index.html) with the code below.

2. In index.html replace the placeholder "Your Azure Maps Key" with the primary key for your Azure Maps account

File Edit Selection View Go Run Terminal Help index.html - AzM_Web_PubSub_Demo

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- index
- function.json
- index.js
- > negotiate
- > notification
- > obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

index.html x

index.html > html

```
1<html>
2  <head>
3    <title>Azure Maps Web PubSub</title>
4    <link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/icon.png"/>
5    <meta charset="utf-8"/>
6    <meta http-equiv="x-ua-compatible" content="IE=Edge"/>
7    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no"/>
8    <!--Load the JavaScript and CSS files for the Azure Maps SDK.-->
9    <link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css"/>
10   <script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js"/>
11   <!--Load the JavaScript and CSS files that has our custom control.-->
12   <link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-control.css"/>
13   <script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-control.js"/>
14 
15  <style>...
16  </style>
17 </head>
18 <body onload="InitMap()">
19   <div id="myMap"></div>
20 >   <div class="controlContainer">...
21   </div>
22 
23   <script>
24   // ...
25   // Begin Edits
26   // ...
27   var mapKey = 'JhFqWUORigWCrqie60kD0zCLvke1o6jR0sdsgwgIi0o';
28   var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
29   // ...
30   // End Edits
31   // ...
32 </script>
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func start

Azure Functions Core Tools

Core Tools Version: 4.0.4590 Commit hash: N/A (64-bit)

Function Runtime Version: 4.5.2.18383

Functions:

```
index: [GET,POST] http://localhost:7071/api/index
negotiate: http://localhost:7071/api/negotiate
notification: [GET,POST] http://localhost:7071/api/notification
```

For detailed output, run func with --verbose flag.

[2022-06-15T16:35:00.088Z] Worker process started and initialized.

Ln 322, Col 8 (13564 selected) Spaces: 4 UTF-8 CRLF HTML Go Live

1. Run the function locally
func start

Azure Subscription Library | Tutorial - Create a serverless noti | azure-maps-demos - Microsoft | Azure Maps Web PubSub | +

localhost:7071/api/index

Layers

- Heatmap
- Last Location
- Image Layer
- Tile Layer

Heatmap Intensity

Heatmap Radius

Enter Device ID Find Device Load History

Seattle Map showing various neighborhoods and landmarks.

Navigate to the webpage (index.html)

This sample page showcases a few features of the Azure Maps Web SDK. Standalone examples can be found in [Azure Maps Samples](#), incl.:

- [Heat Map](#)
- [Layer Control](#)
- [Image Layer](#)
- [Tile Layer](#)

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

My Workspace

New Import

GET http://localhost:7071/api/notification

http://localhost:7071/api/notification

GET http://localhost:7071/api/notification

Params Authorization Headers (8) Body Pre-request Script Test

Body (raw JSON)

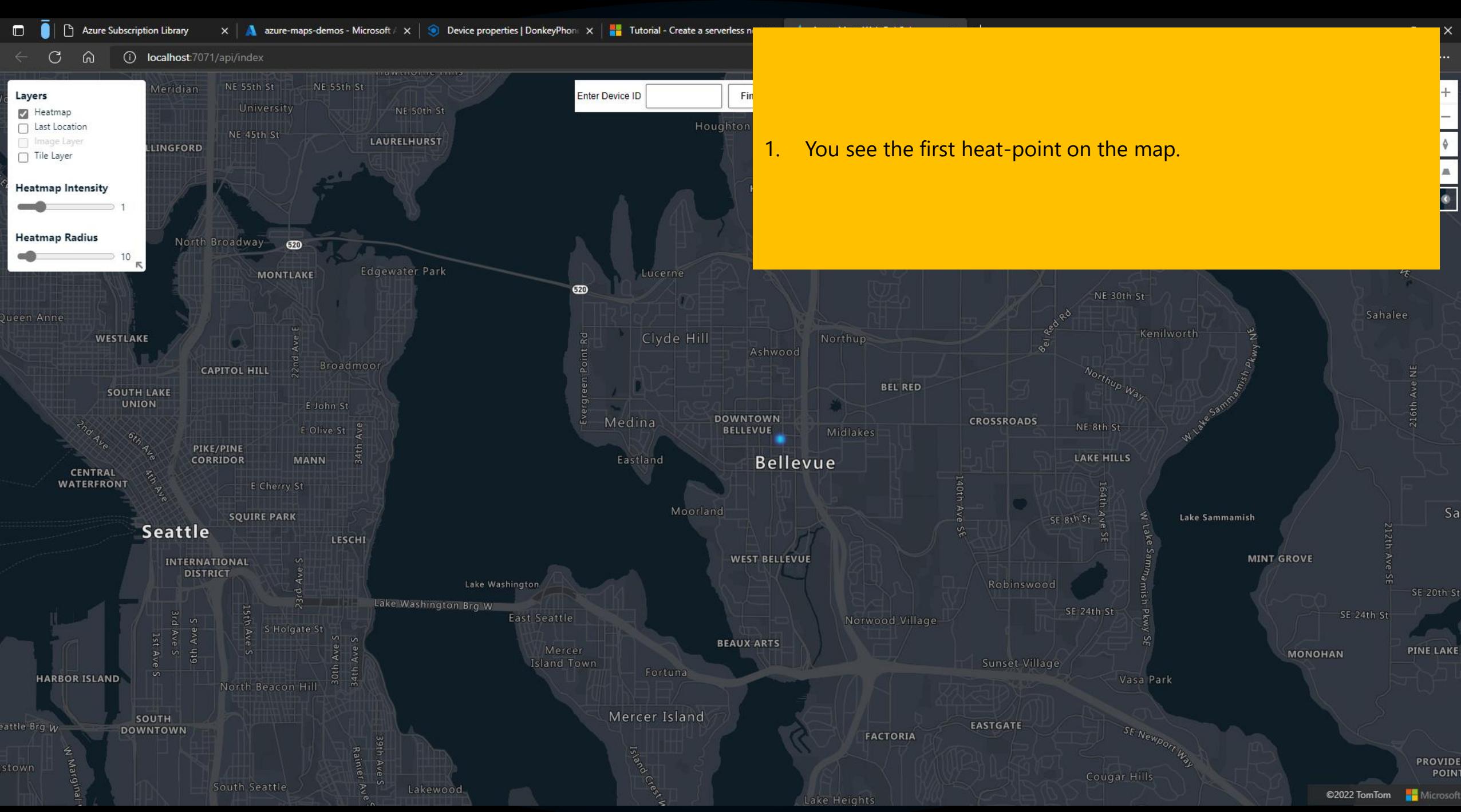
```
{  
  "deviceId": "DonkeyPhone",  
  "enqueuedTime": "2022-06-14T21:25:58.577Z",  
  "telemetry": {  
    "geolocation": {  
      "alt": 144.1,  
      "lat": 47.614953,  
      "lon": -122.194170  
    }  
  }  
}
```

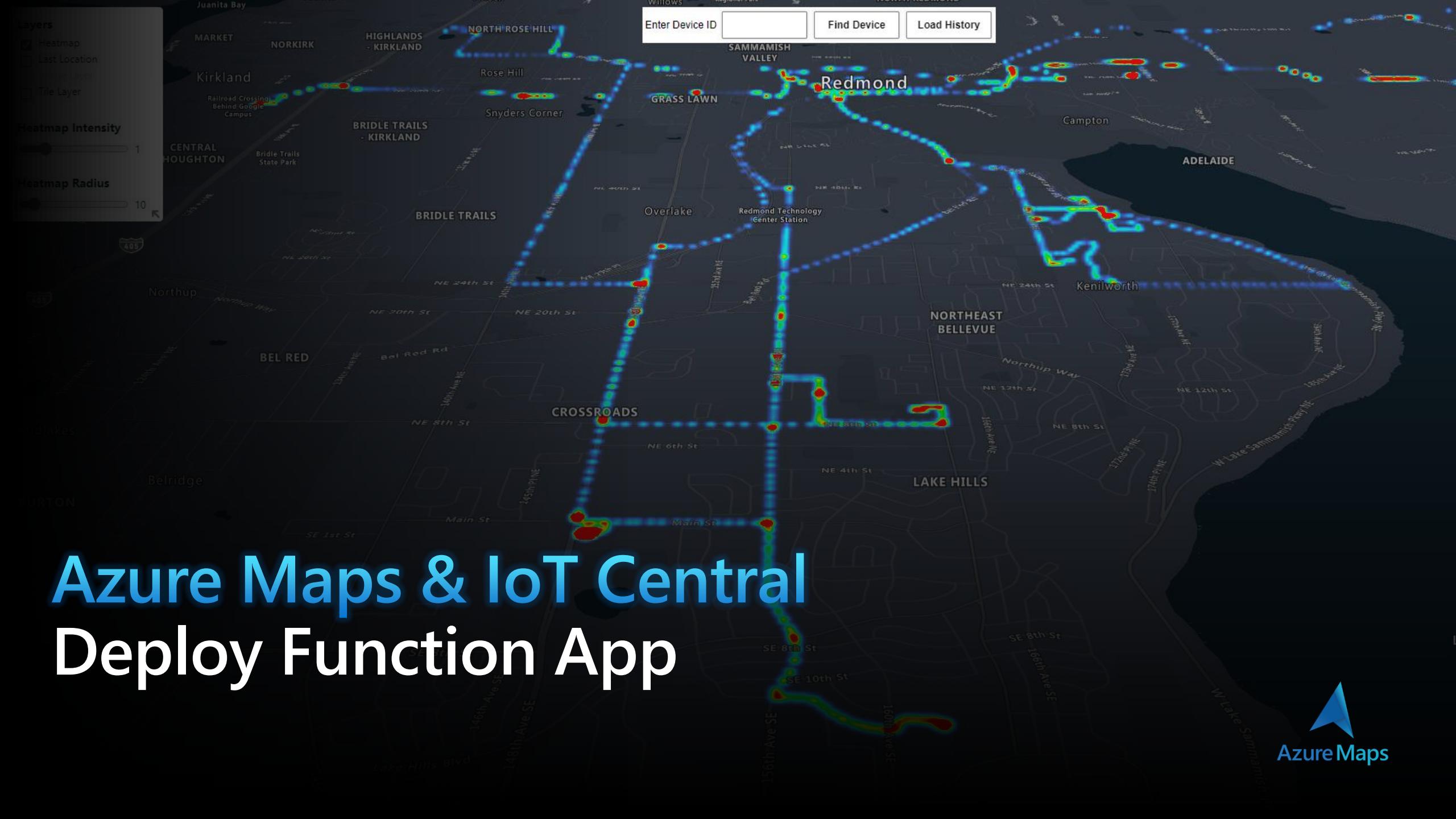
Body Cookies Headers (3) Test Results

Pretty Raw Preview Visualize Text

Find and Replace Console

Open Postman and craft a message that mimics telemetry data coming from IoT Central





Azure Maps

Azure Subscription Library IOTC - Microsoft Azure Device properties | DonkeyPhone Tutorial - Create a serverless n

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Resource group

Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

IOTC Overview Create Manage view Delete resource group Refresh

Subscription (move) : Azure Maps - SubLib - Loan05 Subscription ID : 2aa49947-b38a-4a9c-957b-8c551c321ba8

Tags (edit) : Env : NonProd

Essentials

Activity log Access control (IAM) Tags Resource visualizer

Events

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 3 of 3 records. Show hidden types

Name	Type	Location
azure-maps-demos	IoT Central Application	East US
azure-maps-demos	Azure Maps Account	East US
azure-maps-demos	Web PubSub Service	East US

No grouping List view

1. Navigate to the Azure Portal and there to your resource groups with the 3 resources you have created thus far.
2. Click on [Create].

Give feedback

Azure Subscription Library Create a resource - Microsoft A... Device properties | DonkeyPhone Tutorial - Create a serverless n...

https://ms.portal.azure.com/#view/Microsoft_Azure_Marketplace/PlusNewBlade/package~/null/additionalConfig~/null/dontDisc...

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Home > IOTC >

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Azure Active Directory

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

Monitor

Advisor

Microsoft Defender for Cloud

Cost Management + Billing

Help + support

Get Started

Recently created

Categories

- AI + Machine Learning
- Analytics
- Blockchain
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things
- IT & Management Tools
- Media
- Migration
- Mixed Reality
- Monitoring & Diagnostics
- Networking
- Security
- Storage
- Web

function

Function App

MAKANA Python Function

Azure Network Function Manager - Device

Perforce – Enhanced Studio Pack (Includes Fully ...

Playwright on Azure Functions

Azure Cosmos DB

Create | Docs | MS Learn

Function App

Create | Docs

SQL Database

Create | Docs | MS Learn

Storage account

Create | Docs | MS Learn

DevOps Starter

Create | Docs | MS Learn

Web App

Create | Docs | MS Learn

Getting Started? T

Create | Learn more

Ubuntu Server 20.04 LTS

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Set up + subscribe | Learn more

StartStopV2

Create | Learn more

Single VM

Create | Learn more

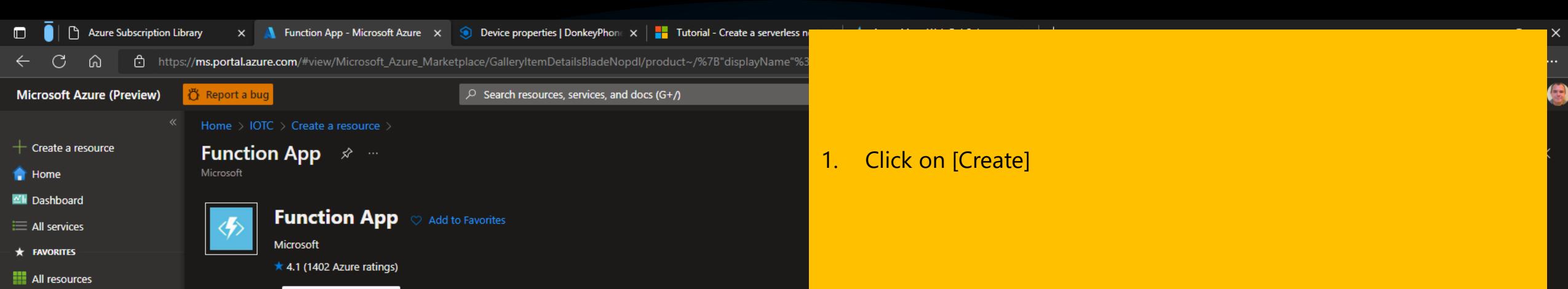
Azure CLI packaged by Bitnami

Create | Learn more

Per IAM App

Create | Learn more

1. Search for [Function App]



1. Click on [Create]

Azure Subscription Library Create Function App - Microsoft Device properties | DonkeyPhone Tutorial - Create a serverless ...

https://ms.portal.azure.com/#create/Microsoft.FunctionApp

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services All Favorites All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > Create a resource > Function App >

Create Function App

Basics Hosting Networking Monitoring Tags Review + create

Create a function app, which lets you group functions as a logical unit for easier management, deployment and sharing of resources. Functions lets you execute your code in a serverless environment without having to first create a VM or publish a web application.

Project Details

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

Subscription * Azure Maps - SubLib - Loan05
Resource Group * IOTC [Create new](#)

Instance Details

Function App name * azure-maps-demos.azurewebsites.net
Publish * Code Docker Container
Runtime stack * Node.js
Version * 16 LTS
Region * East US

Operating system

The Operating System has been recommended for you based on your selection of runtime stack.

Operating System * Linux Windows

Plan

The plan you choose dictates how your app scales, what features are enabled, and how it is priced. [Learn more](#)

[Review + create](#) [< Previous](#) [Next : Hosting >](#)

1. Provide a name
2. Select Node.js as the runtime
3. Pick the same region where you have also deployed the previous resources.
4. Use Linux as the operating system and scroll further down...

Azure Subscription Library Create Function App - Microsoft Device properties | DonkeyPhone Tutorial - Create a serverless n ...

https://ms.portal.azure.com/#create/Microsoft.FunctionApp

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > Create a resource > Function App >

Create Function App

Create a function app, which lets you group functions as a logical unit for easier management, deployment and sharing of resources. Functions lets you execute your code in a serverless environment without having to first create a VM or publish a web application.

Project Details

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

Subscription * (i) Azure Maps - SubLib - Loan05

Resource Group * (i) IOTC Create new

Instance Details

Function App name * azure-maps-demos .azurewebsites.net

Publish * Code Docker Container

Runtime stack * Node.js

Version * 16 LTS

Region * East US

Operating system

The Operating System has been recommended for you based on your selection of runtime stack.

Operating System * Linux Windows

Plan

The plan you choose dictates how your app scales, what features are enabled, and how it is priced. [Learn more](#)

Plan type * (i) Consumption (Serverless)

Review + create < Previous Next : Hosting >

1. ...to pick [Consumption (Serverless)] as the pricing plan.
2. Click [Next : Hosting]

Microsoft Azure (Preview) [Report a bug](#)

Home > IOTC > Create a resource > Function App >

Create Function App

Basics **Hosting** Networking Monitoring Tags Review + create

Storage

When creating a function app, you must create or link to a general-purpose Azure Storage account that supports Blobs, Queue, and Table storage.

Storage account * [Create new](#)

1. Click [Create new]...

[Review + create](#) [< Previous](#) [Next : Networking >](#)

Azure Subscription Library Create Function App - Microsoft Device properties | DonkeyPhone Tutorial - Create a serverless n ...

https://ms.portal.azure.com/#create/Microsoft.FunctionApp

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+/)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > Create a resource > Function App > Create Function App

Basics Hosting Networking Monitoring Tags Review + create

Storage

When creating a function app, you must create or link to a general-purpose Azure Storage account that supports Blobs, Queue, and Table storage.

Storage account * (New) iotcb7c3 Create new

New Storage Account Name * azuremapsdemos OK Cancel

Review + create < Previous Next : Networking >

1. ...and provide a name to create a new Storage Account for the Function app.
2. Click [OK]
3. Click [Next : Networking]

Azure Subscription Library Create Function App - Microsoft Device properties | DonkeyPhone Tutorial - Create a serverless n ...

https://ms.portal.azure.com/#create/Microsoft.FunctionApp

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > Create a resource > Function App >

Create Function App

Basics Hosting Networking Monitoring Tags Review + create

Function Apps can be provisioned with the inbound address being public to the internet or isolated to an Azure virtual network. Function Apps can also be provisioned with outbound traffic able to reach endpoints in a virtual network, be governed by network security groups or affected by virtual network routes. By default, your app is open to the internet and cannot reach into a virtual network. These aspects can also be changed after the app is provisioned. [Learn more](#)

⚠ Network injection is only available in Functions Premium and Basic, Standard, Premium, Premium V2, Premium V3 Dedicated App Service plans.

Enable network injection On Off

1. Click [Next : Monitoring]

Review + create < Previous Next : Monitoring >

Azure Subscription Library Create Function App - Microsoft Device properties | DonkeyPhone Tutorial - Create a serverless n ...

https://ms.portal.azure.com/#create/Microsoft.FunctionApp

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor Microsoft Defender for Cloud Cost Management + Billing Help + support

Home > IOTC > Create a resource > Function App >

Create Function App

Basics Hosting Networking Monitoring Tags Review + create

Azure Monitor application insights is an Application Performance Management (APM) service for developers and DevOps professionals. Enable it below to automatically monitor your application. It will detect performance anomalies, and includes powerful analytics tools to help you diagnose issues and to understand what users actually do with your app. [Learn more](#)

1. Select [Yes] to enable Application Insights
2. Click [Review and Create]

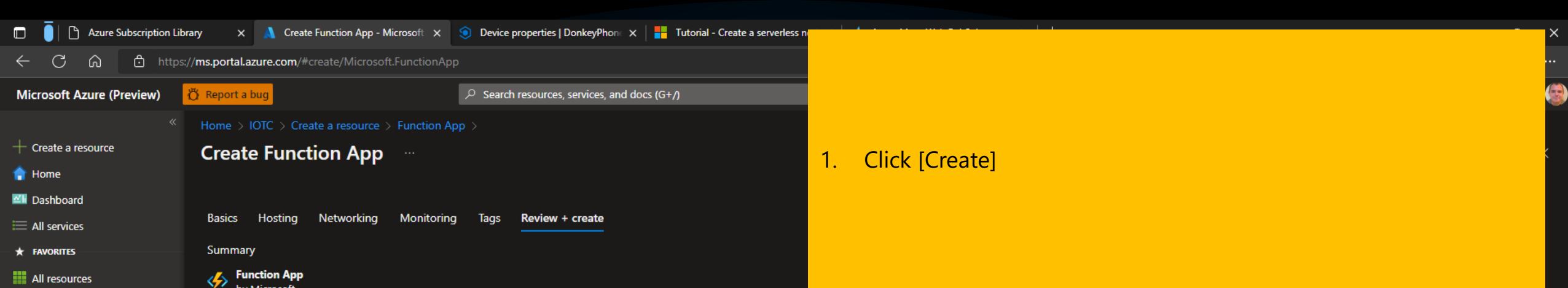
Application Insights

Enable Application Insights * Yes

Application Insights *

Region

Review + create **< Previous** **Next : Tags >**



1. Click [Create]

Microsoft Azure (Preview) [Report a bug](#)

Home > Microsoft.Web-FunctionApp-Portal-0150f334-a6cd | Overview

[Create a resource](#) [Home](#) [Dashboard](#) [All services](#) [FAVORITES](#) [All resources](#) [Azure Active Directory](#) [Resource groups](#) [App Services](#) [Function App](#) [SQL databases](#) [Azure Cosmos DB](#) [Virtual machines](#) [Load balancers](#) [Storage accounts](#) [Virtual networks](#) [Monitor](#) [Advisor](#) [Microsoft Defender for Cloud](#) [Cost Management + Billing](#) [Help + support](#)

[Deployment](#) [Delete](#) [Cancel](#) [Redeploy](#) [Refresh](#)

We'd love your feedback! →

Your deployment is complete

Deployment name: Microsoft.Web-FunctionApp-Portal-0150f334-a... Start time: 6/15/2022, 9:46:30 AM
Subscription: Azure Maps - SubLib - Loan05 Correlation ID: 97616b45-1101-423a-9ebc-7148f671d623 [Download](#)

[Deployment details \(Download\)](#) [Next steps](#)

Create a function. Recommended
Manage deployments for your app. Recommended

[Go to resource](#)

1. After the deployment is complete go to the resource group...

Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
[Set up cost alerts >](#)

Microsoft Defender for Cloud
Secure your apps and infrastructure
[Go to Microsoft Defender for Cloud >](#)

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Azure Subscription Library IOTC - Microsoft Azure Device properties | DonkeyPhone Tutorial - Create a serverless n

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/resourcegroups/IOTC

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Home > Resource groups >

Resource groups

Microsoft (microsoft.onmicrosoft.com)

Create Manage view ...

Filter for any field...

Name	...
cleanupservice	...
DefaultResourceGroup-EUS	...
IOTC	...

Overview Create Manage

Subscription (move) : Azure DevTest Labs Subscription ID : 2aa49947-b38a-4a9c-957b-8c551c321ba8

Tags (edit) : Env : NonProd

Essentials

- Activity log
- Access control (IAM)
- Tags
- Resource visualizer
- Events

Settings

- Deployments
- Security
- Policies
- Properties
- Locks

Cost Management

- Cost analysis
- Cost alerts (preview)
- Budgets
- Advisor recommendations

Monitoring

- Insights (preview)
- Alerts
- Metrics
- Diagnostic settings
- Logs
- Advisor recommendations

You will find a few new resources related to your Function app

- Application Insights
- A Storage Account
- An App Service Plan
- And the Function app itself

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 7 of 7 records. Show hidden types ⓘ No grouping List view

Name	Type	Location
ASP-IOTC-a120	App Service plan	East US
azure-maps-demos	IoT Central Application	East US
azure-maps-demos	Azure Maps Account	East US
azure-maps-demos	Web PubSub Service	East US
azure-maps-demos	Function App	East US
azure-maps-demos	Application Insights	East US
azuremapsdemos	Storage account	East US

< Previous Page 1 of 1 Next > Give feedback

A screenshot of the Visual Studio Code interface. The left sidebar shows a project structure for 'AZM_WEB_PUBSUB_DEMO' containing files like .vscode, bin, index, function.json, index.js, negotiate, notification, obj, .gitignore, extensions.csproj, host.json, index.html, local.settings.json, and package.json. The main editor area displays an 'index.html' file with HTML, CSS, and JavaScript code. The terminal at the bottom shows a command being run: 'PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> az login'. A yellow callout box on the right lists three steps for logging into Azure.

1. In VS Code open a terminal to log into Azure
2. Enter
az login
3. You will be prompted to log into your Azure account using a browser

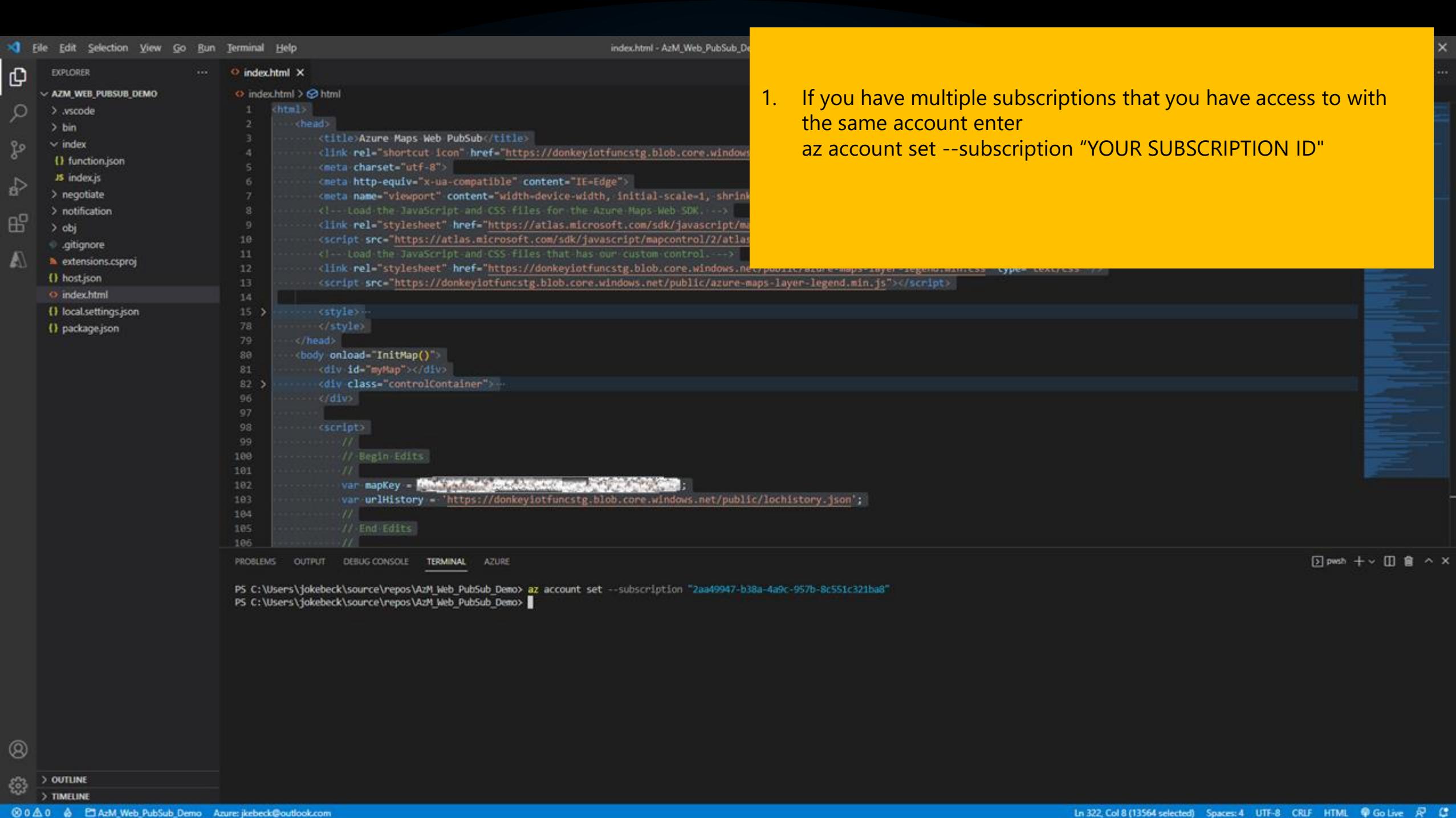
```
<html>
  <head>
    <title>Azure Maps Web PubSub</title>
    <link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json" type="image/x-icon">
    <meta charset="utf-8">
    <meta http-equiv="x-ua-compatible" content="IE=Edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
    <!-- Load the JavaScript and CSS files for the Azure Maps Web SDK. -->
    <link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css" type="text/css" />
    <script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js" type="text/javascript" />
    <!-- Load the JavaScript and CSS files that has our custom control. -->
    <link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.css" type="text/css" />
    <script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.js"></script>
  </head>
  <body onload="InitMap()">
    <div id="myMap"></div>
    <div class="controlContainer">
      </div>
    </div>
    <script>
      // Begin Edits
      // ...
      var mapKey = '00000000-0000-0000-0000-000000000000';
      var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
      // ...
      // End Edits
      // ...
    </script>
  </body>

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> az login

Ln 322, Col 8 (13564 selected) Spaces: 4 UTF-8 CRLF HTML Go Live



File Edit Selection View Go Run Terminal Help

index.html - AzM_Web_PubSub_D...

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > .vscode
- > bin
- index
- function.json
- index.js
- > negotiate
- > notification
- > obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

index.html

```
1 <html>
2   <head>
3     <title>Azure Maps Web PubSub</title>
4     <link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.css" type="image/x-icon">
5     <meta charset="utf-8">
6     <meta http-equiv="x-ua-compatible" content="IE=Edge">
7     <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
8     <!-- Load the JavaScript and CSS files for the Azure Maps Web SDK. -->
9     <link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css" type="text/css">
10    <script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js">
11    <!-- Load the JavaScript and CSS files that has our custom control. -->
12    <link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.css" type="text/css">
13    <script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.js"></script>
14
15   <style>...
16   </style>
17 </head>
18 <body onload="InitMap()">
19   <div id="myMap"></div>
20   <div class="controlContainer">
21     </div>
22   </div>
23
24   <script>
25   // ...
26   // Begin Edits
27   // ...
28   var mapKey = '00000000-0000-0000-0000-000000000000';
29   var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
30   // ...
31   // End Edits
32   // ...
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
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97
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99
100
101
102
103
104
105
106
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> az account set --subscription "2aa49947-b38a-4a9c-957b-8e551c321ba8"

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>

OUTLINE

TIMELINE

Ln 322, Col 8 (13564 selected) Spaces: 4 UTF-8 CRLF HTML Go Live

0 ▲ 0 ▲ 0 ▲ AzM_Web_PubSub_Demo Azure: jokebeck@outlook.com

1. If you have multiple subscriptions that you have access to with the same account enter
az account set --subscription "YOUR SUBSCRIPTION ID"

File Edit Selection View Go Run Terminal Help

index.html - AzM_Web_PubSub_Demo

EXPLORER

AZM_WEB_PUBSUB_DEMO

- .vscode
- bin
- index
- function.json
- index.js
- negotiate
- notification
- obj
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

index.html

```
<html>
  <head>
    <title>Azure Maps Web PubSub</title>
    <link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.css" type="image/x-icon">
    <meta charset="utf-8">
    <meta http-equiv="x-ua-compatible" content="IE=Edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
    <!-- Load the JavaScript and CSS files for the Azure Maps SDK. -->
    <link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css" type="text/css" />
    <script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js"></script>
    <!-- Load the JavaScript and CSS files that has our custom control. -->
    <link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.css" type="text/css" />
    <script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azure-maps-layer-legend.min.js"></script>
  </head>
  <body onload="InitMap()">
    <div id="myMap"></div>
    <div class="controlContainer">
      </div>
    </div>
    <script>
      // ...
      // Begin Edits
      // ...
      var mapKey = 'YOUR_AZURE_MAPS_KEY';
      var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
      // ...
      // End Edits
    </script>
  </body>
</html>
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> az account set --subscription "2aa49947-b38a-4a9c-957b-8c551c321ba8"
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func azure functionapp publish azure-maps-demos --publish-local-settings

Welcome to .NET 6.0!

SDK Version: 6.0.301

Telemetry

The .NET tools collect usage data in order to help us improve your experience. It is collected by Microsoft and shared with the community. You can opt-out of telemetry by setting the DOTNET_CLI_TELEMETRY_OPTOUT environment variable to '1' or 'true' using your favorite shell.

Read more about .NET CLI Tools telemetry: <https://aka.ms/dotnet-cli-telemetry>

OUTLINE

TIMELINE

Installed an ASP.NET Core HTTPS development certificate.
To trust the certificate run 'dotnet dev-certs https --trust' (Windows and macOS only).

Ln 322, Col 8 (13564 selected) Spaces: 4 UFT-8 CRLF HTML Go Live

The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer:** Shows the project structure under "AZM_WEB_PUBSUB_DEMO" with files like .gitignore, extensions.csproj, host.json, index.html, local.settings.json, and package.json.
- Terminal:** The current tab is "local.settings.json - AzM_Web_PubSub_Demo". It displays the JSON content:

```
1  {
2    "IsEncrypted": false,
3    "Values": {
4      "FUNCTIONS_WORKER_RUNTIME": "node",
5      "AzureWebJobsStorage": "UseDevelopmentStorage=none",
6      "WebPubSubConnectionString": "Endpoint=https://azure-maps-demos.webpubsub.azure.com;IdentityMode=AzureWebJobs"
7    },
8    "ConnectionStrings": {}
9 }
```
- Terminal Output:** Shows the command-line interaction:

```
Would you like to overwrite value in azure? [yes/no/show]
Would you like to overwrite value in azure? [yes/no/show]
no
Setting WebPubSubConnectionString = ****
Syncing triggers...
Functions in azure-maps-demos:
  index - [httpTrigger]
    Invoke url: https://azure-maps-demos.azurewebsites.net/api/index

  negotiate - [httpTrigger]
    Invoke url: https://azure-maps-demos.azurewebsites.net/api/negotiate

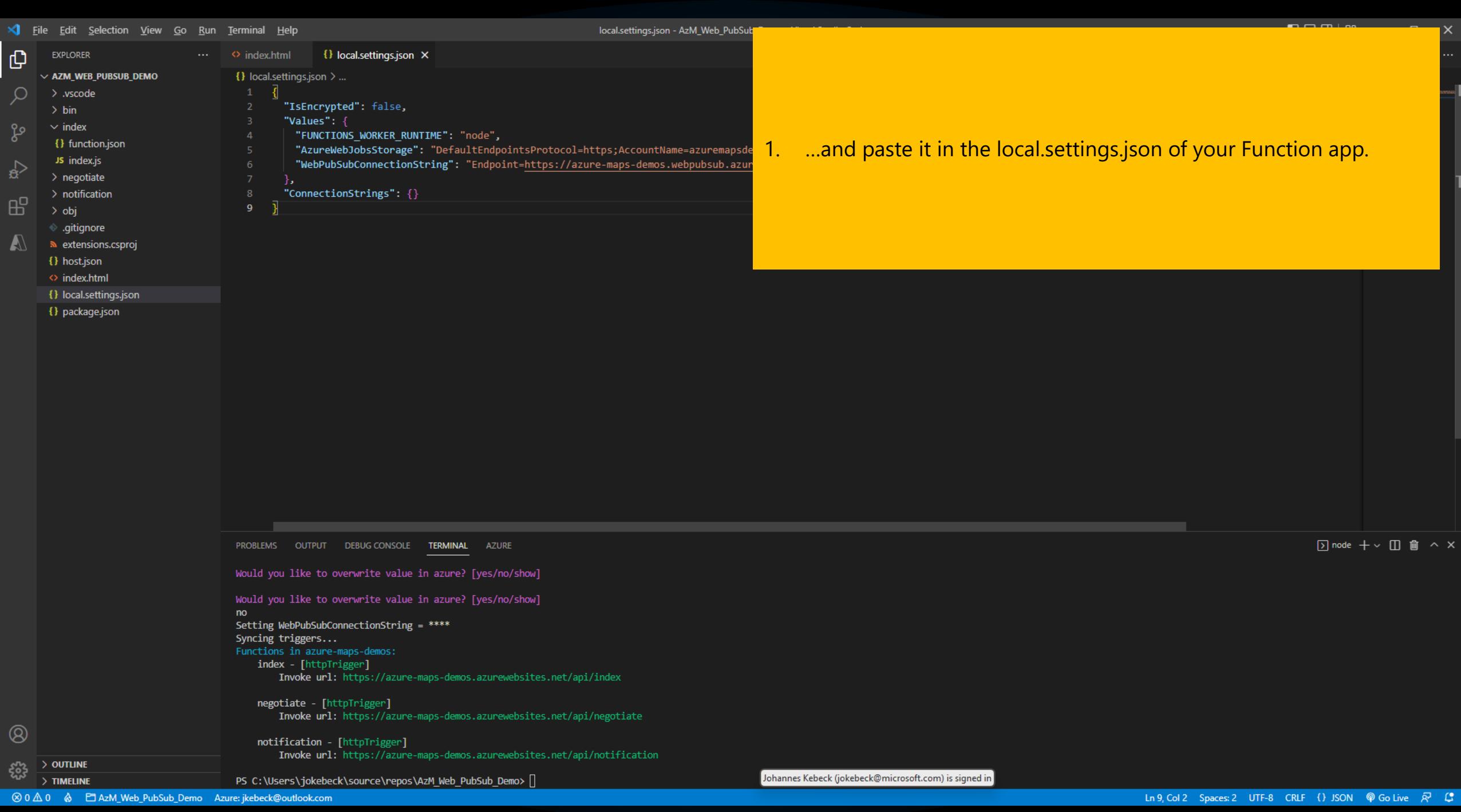
  notification - [httpTrigger]
    Invoke url: https://azure-maps-demos.azurewebsites.net/api/notification
```
- Status Bar:** Shows the file path "PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo", the terminal command "PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo", the file count "0", the line count "Ln 5, Col 55", and other status indicators.

A yellow callout box highlights the terminal output area with the following text:

1. Do not overwrite the storage account settings in the cloud.
2. If you want to avoid that prompt...

The screenshot shows the Microsoft Azure Portal interface. The left sidebar contains a navigation menu with various service icons and links such as 'Create a resource', 'Home', 'Dashboard', 'All services', 'FAVORITES', 'All resources', 'Azure Active Directory', 'Resource groups', 'App Services', 'Function App', 'SQL databases', 'Azure Cosmos DB', 'Virtual machines', 'Load balancers', 'Storage accounts', 'Virtual networks', 'Monitor', 'Advisor', 'Microsoft Defender for Cloud', 'Cost Management + Billing', and 'Help + support'. The main content area is titled 'azuremapsdemos | Access keys' and shows details for a Storage account named 'azuremapsdemos'. It displays two sets of access keys: 'key1' and 'key2'. Each key has a 'Rotate key' button. The 'Key' field for key1 contains a long, complex string of characters, and the 'Connection string' field also contains a similar string. The 'key2' section has a similar layout. At the top of the page, there are tabs for 'Overview', 'Activity log', 'Tags', 'Diagnose and solve problems', 'Access Control (IAM)', 'Data migration', and 'Storage browser (preview)'. There is also a 'Search (Ctrl+I)' bar and buttons for 'Hide keys', 'Set rotation reminder', and 'Refresh'.

1. Copy the connection string for the Storage Account from the Azure Portal...

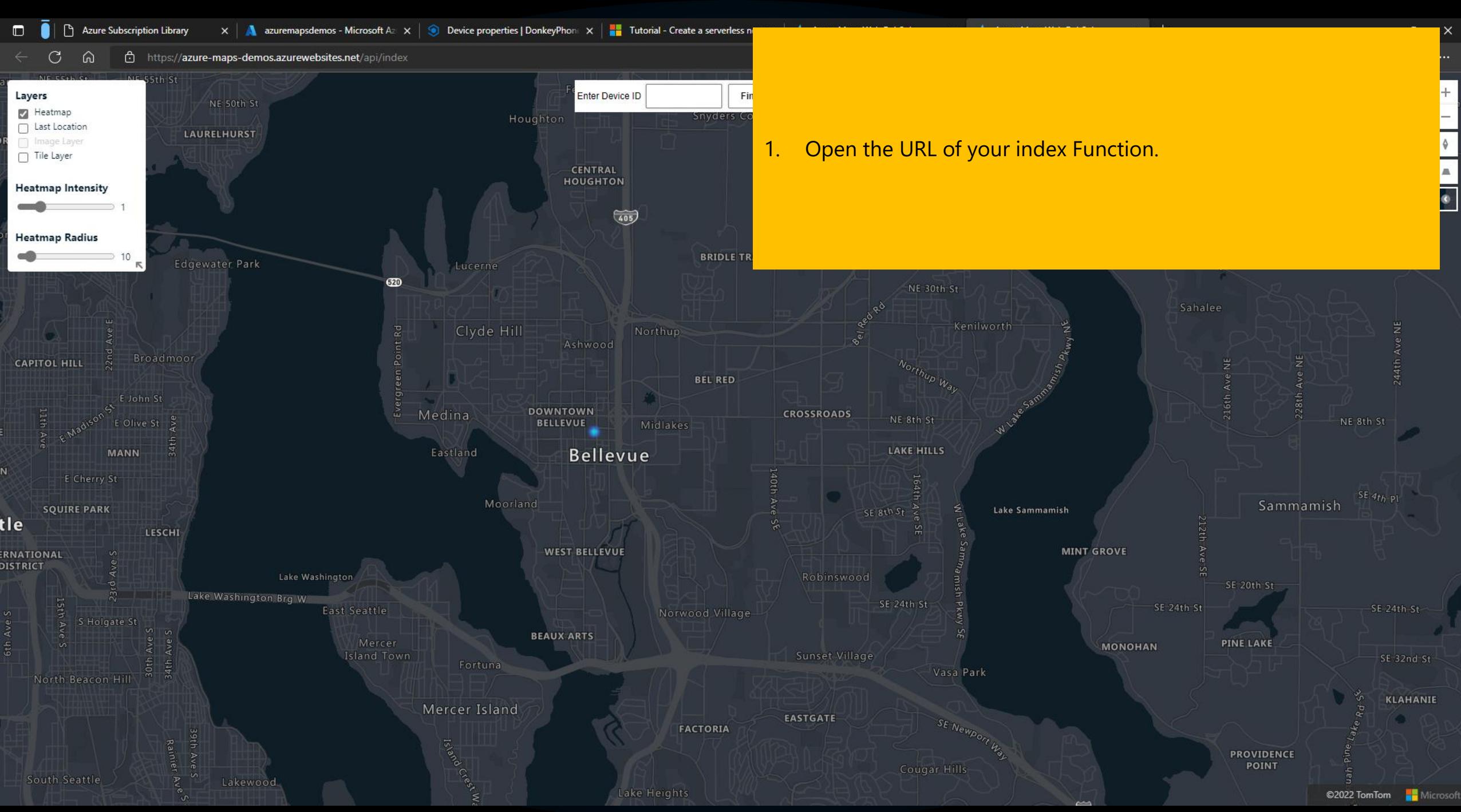


The screenshot shows the Microsoft Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Explorer:** Shows the project structure for "AZM_WEB_PUBSUB_DEMO" with files like .vscode, bin, index, function.json, index.js, negotiate, notification, obj, .gitignore, extensions.csproj, host.json, index.html, local.settings.json (selected), and package.json.
- Editor:** The "local.settings.json" file is open, displaying its contents:

```
1  {
2      "IsEncrypted": false,
3      "Values": {
4          "FUNCTIONS_WORKER_RUNTIME": "node",
5          "AzureWebJobsStorage": "DefaultEndpointsProtocol=https;AccountName=azuremap...de",
6          "WebPubSubConnectionString": "Endpoint=https://azure-maps-demos.webpubsub.azure.com;Id=...;Key=*****"
7      },
8      "ConnectionStrings": {}
9 }
```
- Terminal:** Shows the output of a command, likely "func azure functions publish", with steps to overwrite values in Azure and sync triggers, listing functions like index, negotiate, and notification.
- Status Bar:** Shows the current directory as "C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo", the user "Johannes Kebeck (jokebeck@microsoft.com) is signed in", and the status bar with "Ln 9, Col 2" and other terminal-related information.

Text Overlay: A yellow box highlights the first step of the process: "1. ...and paste it in the local.settings.json of your Function app."



1. Open the URL of your index Function.

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Search Postman

Cloud Invite Capture Requests Settings Bell Upgrade

My Workspace New Import GET http://localhost:7071/a| GET https://azure-maps-de| + ... No Environment Save

Collections

APIs

Environments

Mock Servers

Monitors

Flows

History

Azure Maps Data v1

Azure Maps Data v2

Azure Maps Geofencing

Azure Maps Geolocation

Azure Maps POI

Azure Maps Render v1

Azure Maps Render v2

Azure Maps Route

Azure Maps Search

Azure Maps Search v2

Azure Maps Spatial

Azure Maps TimeZone

Azure Maps Traffic

Azure Maps Weather

Bing Maps

Bing Maps Locations

Geocode

https://azure-maps-demos.azurewebsites.net/api/notification

GET https://azure-maps-demos.azurewebsites.net/api/notification

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Body (none) form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1: {  
2:   "deviceId": "DonkeyPhone",  
3:   "enqueuedTime": "2022-06-14T21:25:58.577Z",  
4:   "telemetry": {  
5:     "geolocation": {  
6:       "alt": 144.09999084472656,  
7:       "lat": 47.614953,  
8:       "lon": -122.194170  
9:     }  
10:   }  
11: }
```

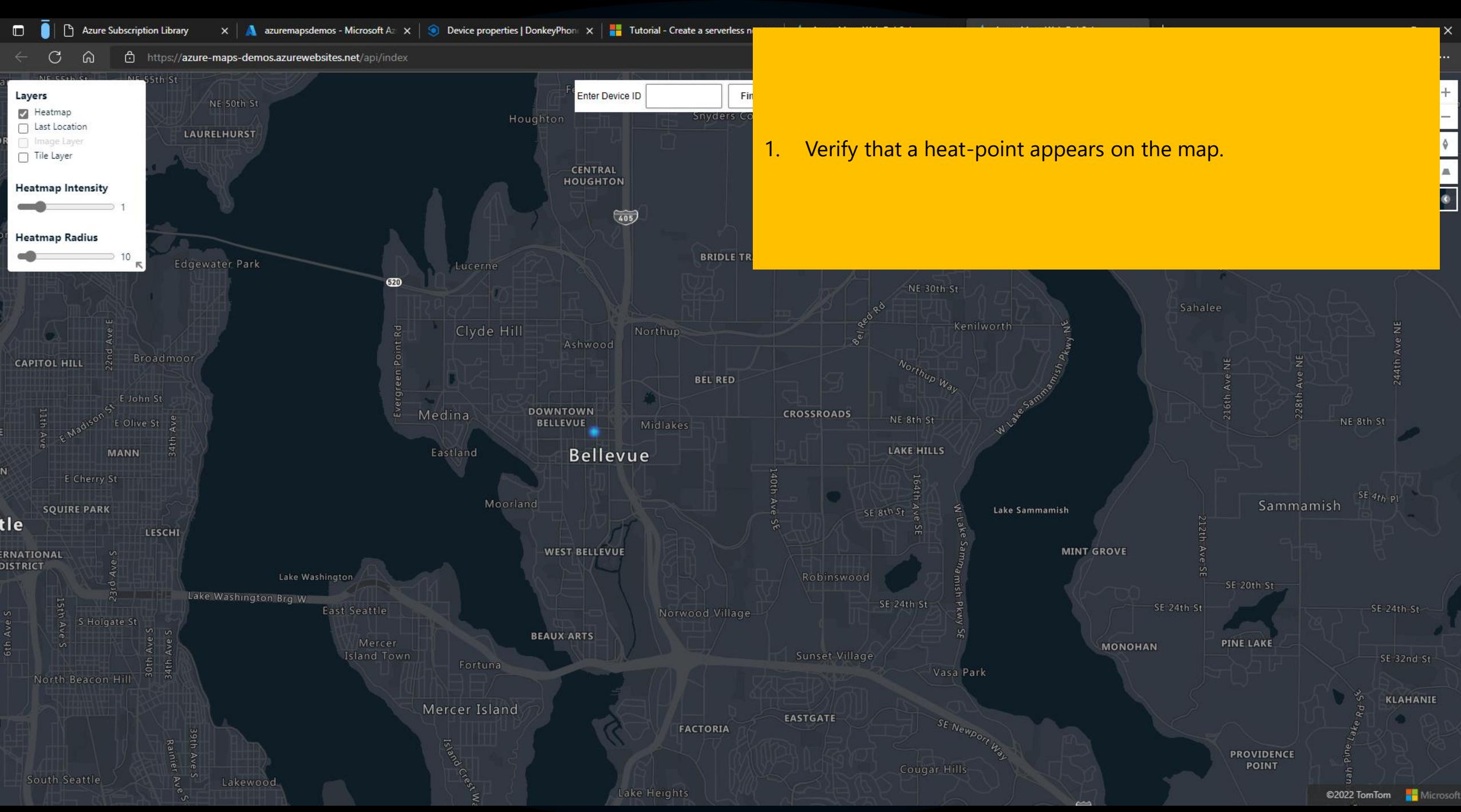
Body Cookies Headers (3) Test Results

Pretty Raw Preview Visualize Text

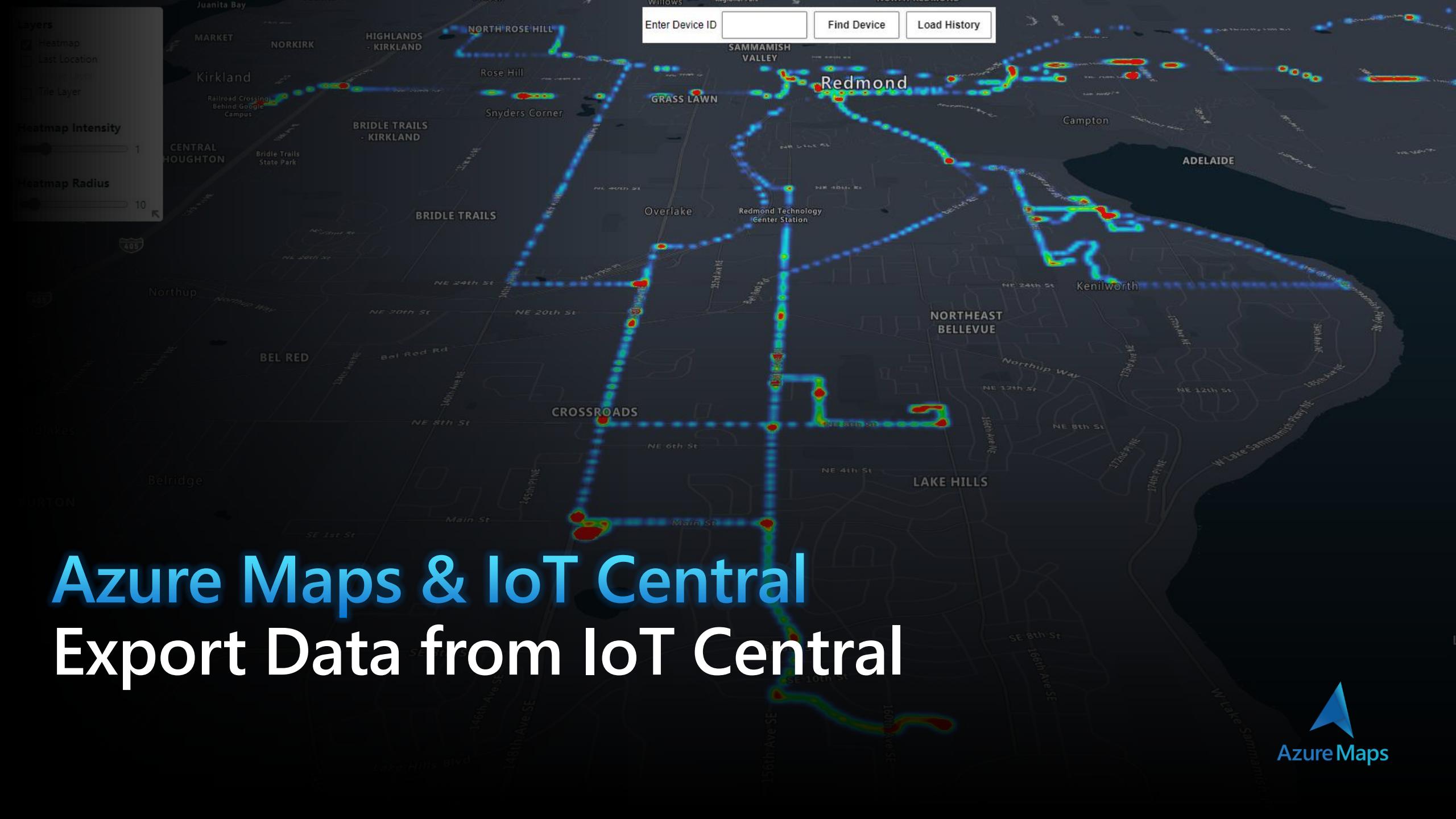
Status: 204 No Content Time: 1902 ms Size: 149 B Save Response

Find and Replace Console

1. In Postman send the message again but this time pick the public URL of your Function app.



1. Verify that a heat-point appears on the map.



Azure Maps

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Data export | Exports, Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports

Azure Maps Demos

+ New export

Data export

Exports Destinations

Search for devices

1. In IoT Central navigate to Data Export
2. Click on [New Export].



Add an export

Continuously export your filtered and enriched IoT data to other parts of your cloud solution for warm-path insights, analytics, visualization, and storage. [Learn more](#)

Add an export

IoT Central Home

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Azure Maps Demos

Save Cancel Rename

Exports > ExportToMap

ExportToMap

Enabled

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export *

Telemetry

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

+ Destination

Search for devices

1. Give the Export a Name.
2. Select Telemetry as type of data to export.
3. Click [+ Filter].

IoT Central Home

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Azure Maps Demos

Save Cancel Rename

Exports > ExportToMap

ExportToMap

Enabled

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export * Telemetry

Export the data if all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

+ Destination

1. For the purpose of this demo we are only interested in the location data. Select [Sensors / Location / Latitude] as the name...
2. ...and [Exists] as the Operator.
3. Under Destination click [create a new one']

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Azure Maps Demos

Save Cancel Rename

Exports > ExportToMap

ExportToMap

Enabled

Data

All of your devices will export data unless you add filters to narrow things down.

Type of data to export *

Telemetry

Export the data if

all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in the message body.

+ Custom string + Property

New destination

To create a new destination, select a connection and provide the connection information. [Learn more](#)

Destination name *

AzureFunction

Destination type *

Webhook

Callback URL *

https://azure-maps-demos.azurewebsites.net/api/notification

Authorization

No auth

Headers

Add custom headers to each message that you export to this destination. Custom headers can be used by the destination to process the message, apply custom logic, and troubleshoot issues.

+ Header

Create Cancel

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

+ Destination

IoT Central Home

Search for devices

1. In the dialog give the destination a name (here: Azure Function).
2. As Destination type select [Webhook].
3. In the callback URL provide the URL to your Azure Function notification.
4. Click on [Create].

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Azure Maps Demos

Save Cancel Rename

Search for devices

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export * Telemetry

Export the data if all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination * AzureFunction Data transformation + Transform X

+ Destination

1. Click [+ Transform].

Azure Maps Demos

Save Cancel Rename

Search for devices

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export * Telemetry

Export the data if all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination * AzureFunction Data transformation + Transform X

+ Destination

1. Click [+ Transform].

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Raw data | DonkeyPhone, Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Search for devices

Azure Maps Demos

Save Cancel Refresh

Data transformation

This is an advanced feature, we recommend you start by visiting the [data transformation documentation](#).

1. Add your input message ⓘ IoT Plug and Play mobile

```
1 {  
2   "applicationId": "ed3027c7-5a10-498d-a6f9-e612e80e542b",  
3   "enqueuedTime": "2017-04-08T03:21:25.985802709Z",  
4   "messageSource": "telemetry",  
5   "component": "sensors",  
6   "telemetry": [  
7     {  
8       "name": "battery",  
9       "value": 1613423289  
10    },  
11    {  
12      "name": "accelerometer"  
13    },  
14    {  
15      "name": "gyroscope"  
16    },  
17    {  
18      "name": "magnetometer"  
19    },  
20    {  
21      "name": "barometer",  
22      "value": 9.695364793993687e+307  
23    },  
24    {  
25      "name": "geolocation"  
26    }  
27  ],  
28  "device": { ...  
105 }  
106 }
```

5 # Here is a sample query to find and assign the value for capability name
6 # import 'iotc' as iotc;
7 # { RangeOfMotion: .telemetry | iotc::find(.name == 'RangeOfMotion').val
8 {
9 schema: "default@v1",
10 applicationId: .applicationId,
11 deviceId: .device.id,
12 templateId: .device.templateId,
13 messageSource: .messageSource,
14 enqueuedTime: .enqueuedTime,
15 telemetry: .telemetry | map({ key: .name, value: .value }) | from_en
16 messageProperties: .messageProperties,
17 enrichments: .enrichments,

2. Preview output message(s) ⓘ

```
1 {  
2   "applicationId": "ed3027c7-5a10-498d-a6f9-e612e80e542b",  
3   "component": "sensors",  
4   "deviceId": "00cpbwsnbawc",  
5   "enqueuedTime": "2017-04-08T03:21:25.985802709Z",  
6   "enrichments": null,  
7   "messageProperties": null,  
8   "messageSource": "telemetry",  
9   "module": null,  
10  "schema": "default@v1",  
11  "telemetry": {  
12    "accelerometer": null,  
13    "barometer": 9.695364793993687e+307,  
14    "battery": 1613423289,  
15    "geolocation": null,  
16    "gyroscope": null,  
17    "magnetometer": null
```

Add Cancel

Connect Devices Device groups Device templates Data explorer Dashboards Jobs + Filter + Message pro + Custom string + P Enrichments Add additional information t Destinations Select destinations for your destination Destination * AzureFunction + Destination

IoT Central Home

1. In the left-hand window you can pick the IoT Plug and Play template from the drop-down to review the template that the client uses.

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Create new export | Azure Maps | Raw data | DonkeyPhone, Azure | Azure Maps Web PubSub | +

https://azure-maps-demos.azureiotcentral.com/data-export/exports/create

Azure Maps Demos

Save Cancel Refresh

Data

All of your devices will export

Type of data to export * Telemetry

Export the data if

Name * Sensors / Location / Latit

+ Filter + Message pro

Connect Devices Device groups Device templates Data explorer Dashboards Manage Jobs

Ext Sec Set

Destination

Add Cancel

Data transformation

This is an advanced feature, we recommend you start by visiting the [data transformation guide](#). Transformations change the shape of your exported messages into a new format.

1. Add your input message IoT Plug and Play mobile

```
1 {  
2   "applicationId": "ed3027c7-5a10-498d-a6f9-e612e80e542b",  
3   "enqueuedTime": "2017-04-08T03:21:25.985802709Z",  
4   "messageSource": "telemetry",  
5   "component": "sensors",  
6   "telemetry": [  
7     {  
8       "name": "geolocation",  
9       "value": {  
10         "lat": 47.6710023,  
11         "lon": -122.0174821,  
12         "alt": 143.79998779296875  
13       }  
14     }  
15   ],  
16   "device": { ...  
17 }
```

2. Build transformation query

```
5 # Here is a sample query to find and assign the value for capability name  
6 # import 'iotc' as iotc;  
7 # { RangeOfMotion: .telemetry | iotc::find(.name == 'RangeOfMotion').val  
8 {  
9   deviceId: .device.id,  
10  enqueueTime: .enqueuedTime,  
11  telemetry: .telemetry | map({ key: .name, value: .value }) | from_en  
12 }
```

3. Preview output message(s)

```
1 {  
2   "deviceId": "00cpbwsnbawc",  
3   "enqueuedTime": "2017-04-08T03:21:25.985802709Z",  
4   "telemetry": {  
5     "geolocation": {  
6       "alt": 143.79998779296875,  
7       "lat": 47.6710023,  
8       "lon": -122.0174821  
9     }  
10   }  
11 }
```

1. As mentioned previously we are only interested in the location data for the purpose of this demo. The name and value of this telemetry data is shown above.
2. Apply the following transformation query

```
{  
  deviceId: .device.id,  
  enqueueTime: .enqueuedTime,  
  telemetry: .telemetry | map({ key: .name, value: .value }) | from_entries,  
}
```

3. Click [Add].

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps | Raw data | DonkeyPhone, Azure Maps

https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4

Azure Maps Demos

Save Delete Rename

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export: Telemetry

Export the data if: all of the conditions are true

Name*: Sensors / Location / Latitude Operator*: Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination *	Data transformation	Export status	Details
AzureFunction	Edit	Starting	X

+ Destination

Search for devices

1. Click [Save].

Save Delete Rename

Connect

Devices

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

Rules

Data export

Security

Permissions

Settings

Application

Customization

IoT Central Home

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps Web PubSub | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4

Search for devices

Save Delete Rename

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export: Telemetry

Export the data if: all of the conditions are true

Name *: Sensors / Location / Latitude Operator *: Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination *	Data transformation	Export status	Details
AzureFunction	Edit	Healthy	X

+ Destination

Azure Maps Demos

Connect

Devices

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

Rules

Data export

Security

Permissions

Settings

Application

Customization

IoT Central Home

1. Once the export status shows [Healthy]...

The screenshot shows a mobile application interface for the 'IoT Plug and Play' service. At the top, there's a header bar with the URL <https://azure-maps-demos.azurewebsites.net/api/index>. Below the header, the application title 'IoT Plug and Play' is displayed along with a gear icon for settings.

The main content area of the app shows six data cards:

- Accelerometer:** x: -1.602, y: 8.998, z: 3.12
- Gyroscope:** x: -0.03, y: -0.042, z: 0.026
- Magnetometer:** x: 13.688, y: -55.5, z: -0.694
- Barometer:** 1,000.864
- Geolocation:** lat: 47.671, lon: -122.017, alt: 143.8
- Battery level:** 93

Below these cards are four navigation icons: Telemetry (blue bar), Properties (grey bar), Image Upload (cloud icon), and Logs (log icon).

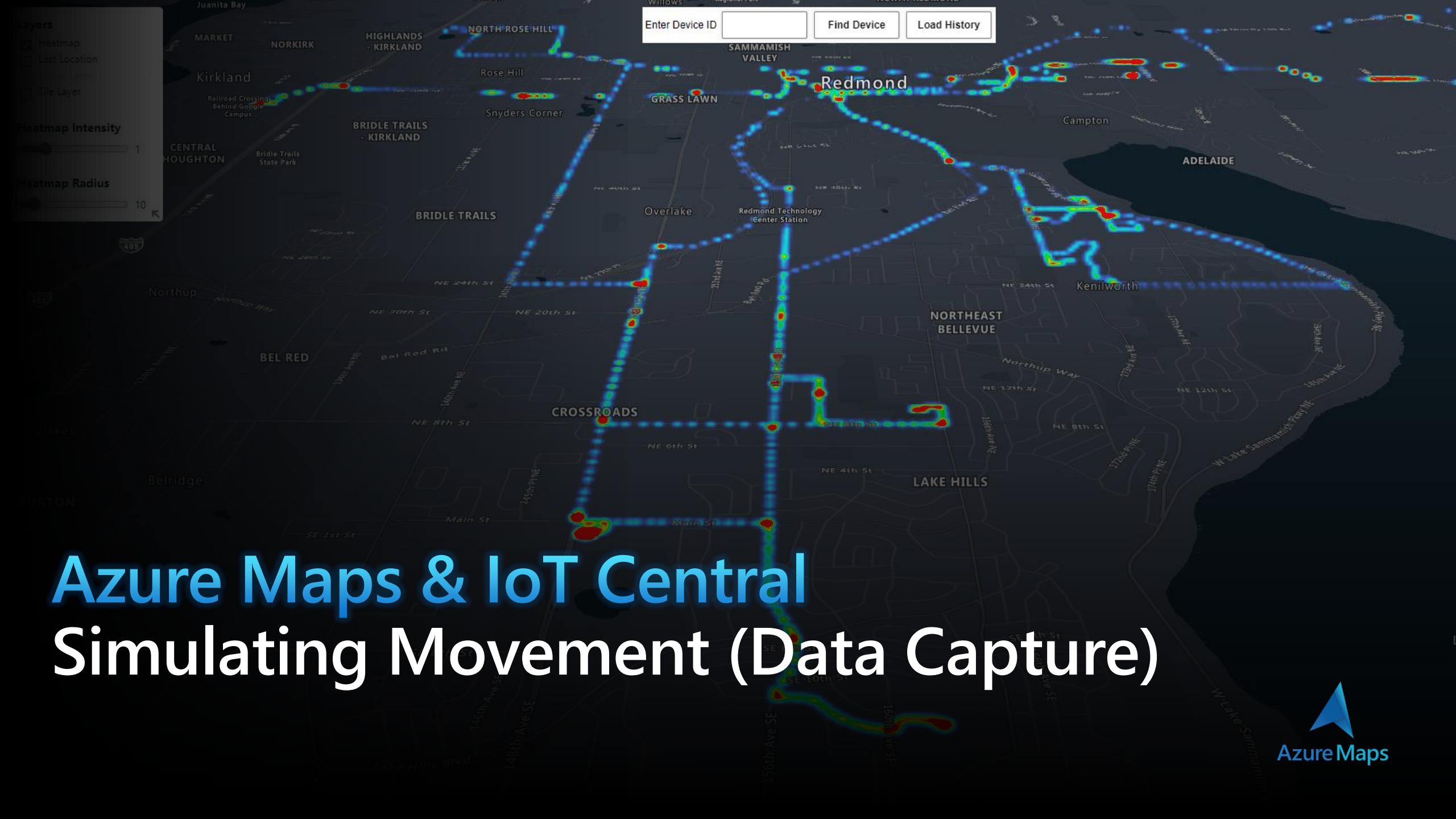
To the left of the app, a sidebar titled 'Layers' is visible, showing options like 'Heatmap' (selected), 'Last Location', 'Image Layer', and 'Tile Layer'. It also includes sliders for 'Heatmap Intensity' (value 1) and 'Heatmap Radius' (value 10). A map of Seattle is shown in the background.

At the bottom of the screen, there are three control buttons: a left arrow, a square, and a right arrow.

On the right side of the image, a large yellow callout box contains the following text:

1. ...open the IoT Plug and Play application on your mobile device and you should see the heat-points show on the map.

The background map shows the city of Bellevue, Washington, with various neighborhoods labeled: University, NE 50th St, WALLING, West Queen Anne, WESTLAKE, SOUTH LAKE UNION, CENTRAL WATERFRONT, Sea, HARBOR ISLAND, Mercer Island, BEAUX ARTS, FACTORIA, EASTGATE, Cougar Hills, Lake Heights, Mercer Island Town, Fortuna, Moorland, Medina, Clyde Hill, Northup, Ashwood, Midlakes, BEL RED, CROSSROADS, LAKE HILLS, Lake Sammamish, MINT GROVE, and MONOHAN. The map also shows Lake Washington and several roads like Evergreen Point Rd, Bel Red Rd, Northup Way, NE 8th St, 140th Ave SE, SE 8th St, 164th Ave SE, W Lake Sammamish Pkwy NE, 212th Ave SE, and SE 24th St.



File Edit View Navigate Code Refactor Build Run Tools VCS Window Help GeoLocation02 - MainActivity.kt [GeoLocation02.app.main]

12:14 5G 72%

GeoLocation

Project

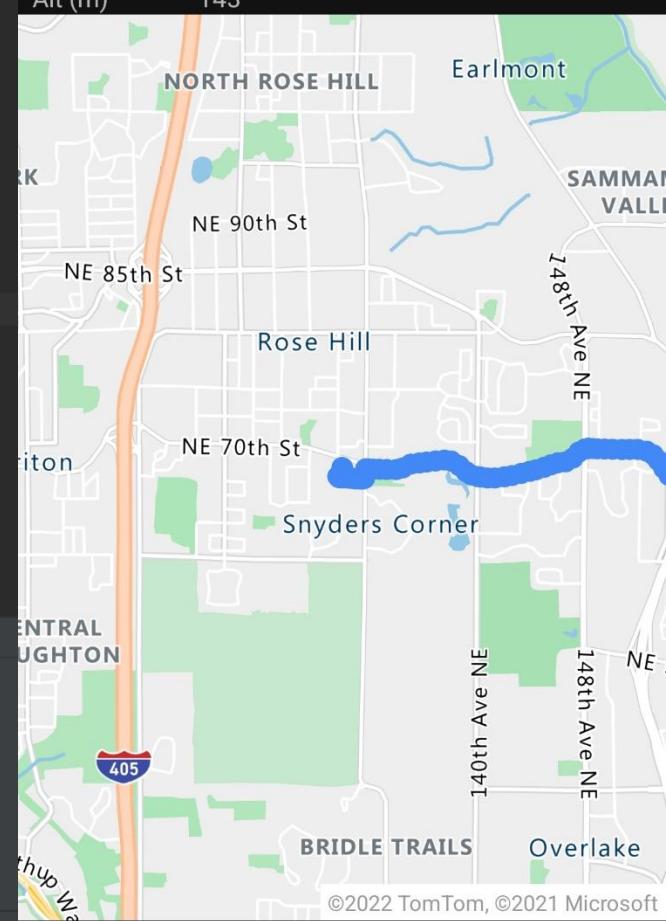
Resource Manager

activity_main.xml x MainActivity.kt x

```
private lateinit var tvBearing : TextView  
private lateinit var tvSpeed : TextView  
private lateinit var btnStartTracking : Button  
private lateinit var btnStopTracking : Button  
private lateinit var btnShowText : Button  
private lateinit var btnShowMap : Button  
private val permissionsRequestCode = 123  
private lateinit var locationManager: GeoLocationManager  
private lateinit var managePermissions: PermissionManager  
private var locationTrackingRequested = false  
private var filename = ""  
private lateinit var file : File  
private lateinit var fileOutputStream : FileOutputStream  
private var counter = 0  
  
companion object {  
    init {  
        AzureMaps.setSubscriptionKey("YOUR AZURE MAPS KEY")  
    }  
}  
  
private var mapControl: MapControl? = null  
  
override fun onCreate(savedInstanceState: Bundle?) {
```

START TRACKING STOP TRACKING

Status	Stopped	Counter	326
Time (h:m:s)	00:25:07	Distance (km)	13.734
Bearing (°)	281	Speed (kph)	0
Lon (°)	-122.16629	Lat (°)	47.66667
Alt (m)	143		



It is hard to see movement patterns while you sit in front of your laptop to develop the application. Hence there are 2 applications to capture and replay movement data.

An Android application for your mobile device to capture data in a CSV-file. This app has an integrated map which needs some more work. Provide your Azure Maps subscription key in the MainActivity.kt file.

Executing tasks: [app:assembleDebug] in project C:\Users\jokebedek\AndroidStudioProjects\GeoLocation02 (a minute ago)

Gradle Build R

File Edit Selection View Go Run Terminal Help

geolog_220615_081600.csv - AzM_Web_PubSub_Demo

EXPLORER

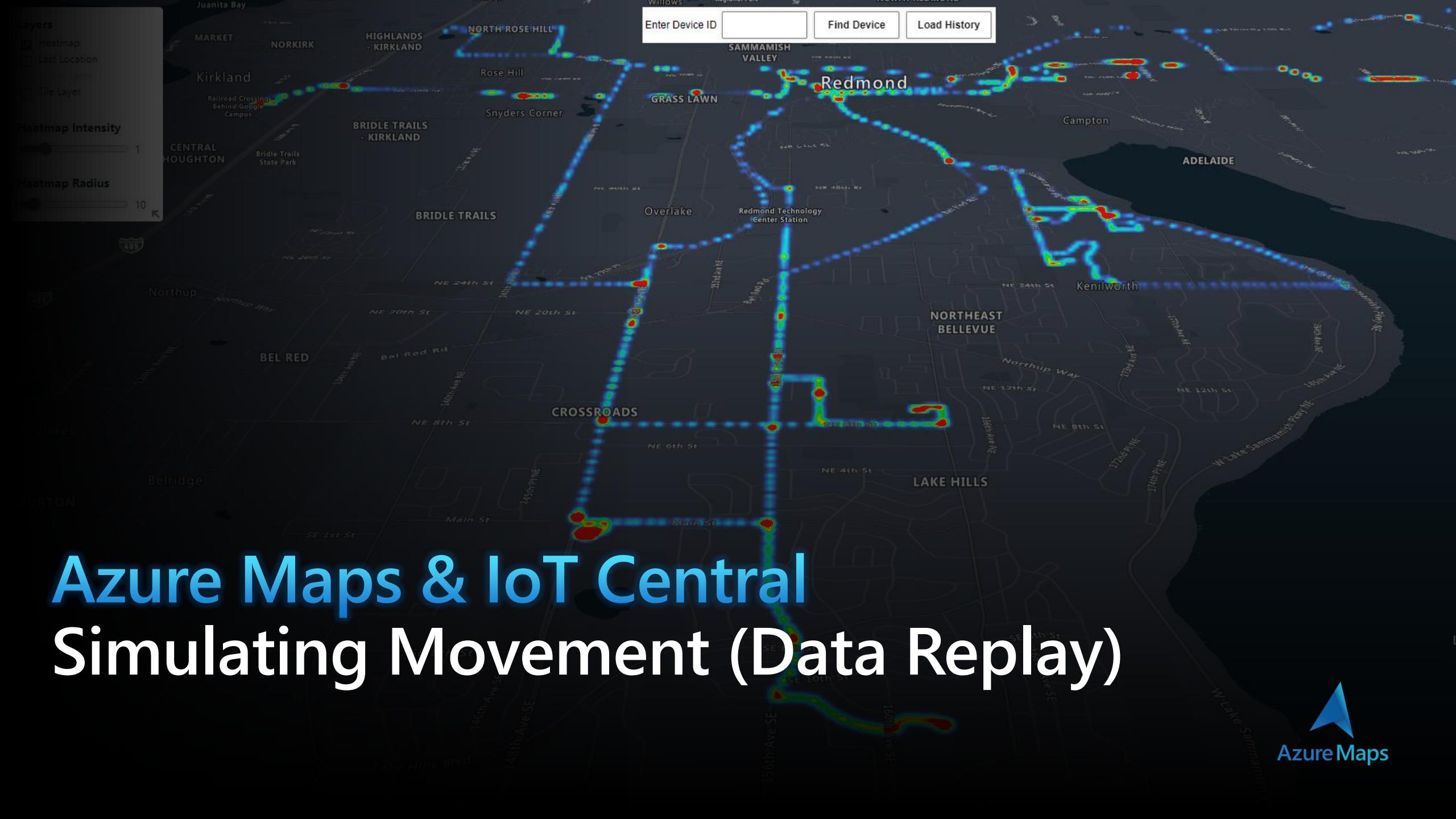
... index.html geolog_220615_081600.csv

C:\Users\jokebeck\OneDrive - Microsoft\Documents\GeoData\GeoLogs\geolog_220615_081600.csv

```
1 DateTime, Lat, Lon, Alt, Bearing, Speed
2 Wed Jun 15 08:15:59 PDT 2022, 47.670976, -122.0172118, 182, 0, 0
3 Wed Jun 15 08:16:04 PDT 2022, 47.6710336, -122.0171093, 181, 99, 6
4 Wed Jun 15 08:16:10 PDT 2022, 47.6709979, -122.0170445, 180, 347, 2
5 Wed Jun 15 08:16:14 PDT 2022, 47.671201, -122.0169701, 179, 4, 14
6 Wed Jun 15 08:16:18 PDT 2022, 47.6713873, -122.0170626, 177, 294, 13
7 Wed Jun 15 08:16:22 PDT 2022, 47.6713981, -122.0174528, 176, 267, 17
8 Wed Jun 15 08:16:27 PDT 2022, 47.671378, -122.0180046, 169, 269, 19
9 Wed Jun 15 08:16:31 PDT 2022, 47.6713759, -122.0184906, 165, 273, 20
10 Wed Jun 15 08:16:35 PDT 2022, 47.6713955, -122.0189788, 166, 270, 20
11 Wed Jun 15 08:16:40 PDT 2022, 47.6713766, -122.0196041, 168, 267, 22
12 Wed Jun 15 08:16:45 PDT 2022, 47.6713593, -122.020322, 170, 267, 24
13 Wed Jun 15 08:16:49 PDT 2022, 47.6713526, -122.0209113, 171, 268, 23
14 Wed Jun 15 08:16:53 PDT 2022, 47.6713528, -122.021431, 170, 271, 17
15 Wed Jun 15 08:16:57 PDT 2022, 47.6713579, -122.0217345, 169, 265, 4
16 Wed Jun 15 08:17:02 PDT 2022, 47.6712123, -122.0219019, 169, 183, 17
17 Wed Jun 15 08:17:07 PDT 2022, 47.6707098, -122.021965, 164, 187, 39
18 Wed Jun 15 08:17:12 PDT 2022, 47.6700076, -122.0220866, 162, 186, 35
19 Wed Jun 15 08:17:16 PDT 2022, 47.6694324, -122.0221806, 159, 188, 34
20 Wed Jun 15 08:17:20 PDT 2022, 47.6688695, -122.0222858, 157, 187, 35
21 Wed Jun 15 08:17:24 PDT 2022, 47.6682945, -122.0224111, 154, 187, 35
22 Wed Jun 15 08:17:28 PDT 2022, 47.6677323, -122.0225031, 152, 181, 35
23 Wed Jun 15 08:17:33 PDT 2022, 47.6670378, -122.0223671, 151, 169, 32
24 Wed Jun 15 08:17:37 PDT 2022, 47.6666301, -122.0222625, 150, 173, 14
25 Wed Jun 15 08:17:42 PDT 2022, 47.6664631, -122.0223145, 151, 213, 14
26 Wed Jun 15 08:17:47 PDT 2022, 47.6662534, -122.0228578, 152, 247, 26
27 Wed Jun 15 08:17:51 PDT 2022, 47.6660498, -122.0235459, 154, 244, 33
28 Wed Jun 15 08:17:55 PDT 2022, 47.6657006, -122.0242286, 155, 219, 43
29 Wed Jun 15 08:18:00 PDT 2022, 47.6650663, -122.02484, 155, 206, 36
30 Wed Jun 15 08:18:04 PDT 2022, 47.6646306, -122.0253458, 154, 241, 33
31 Wed Jun 15 08:18:09 PDT 2022, 47.6646838, -122.0264743, 151, 282, 40
32 Wed Jun 15 08:18:13 PDT 2022, 47.6648471, -122.0274738, 148, 283, 43
33 Wed Jun 15 08:18:18 PDT 2022, 47.6650658, -122.0288573, 143, 283, 48
34 Wed Jun 15 08:18:22 PDT 2022, 47.6652741, -122.0299755, 145, 284, 47
35 Wed Jun 15 08:18:26 PDT 2022, 47.6654725, -122.031084, 146, 285, 47
36 Wed Jun 15 08:18:31 PDT 2022, 47.6657311, -122.0324571, 149, 286, 42
37 Wed Jun 15 08:18:36 PDT 2022, 47.6659864, -122.0335459, 147, 290, 35
38 Wed Jun 15 08:18:41 PDT 2022, 47.6661994, -122.0343871, 148, 290, 25
39 Wed Jun 15 08:18:45 PDT 2022, 47.6662929, -122.0347599, 147, 291, 7
40 Wed Jun 15 08:18:49 PDT 2022, 47.6663258, -122.0348616, 147, 291, 12
41 Wed Jun 15 08:18:54 PDT 2022, 47.6664556, -122.0353646, 145, 289, 25
42 Wed Jun 15 08:18:59 PDT 2022, 47.6666243, -122.036272, 142, 281, 36
43 Wed Jun 15 08:19:04 PDT 2022, 47.666786, -122.0373696, 132, 281, 47
44 Wed Jun 15 08:19:08 PDT 2022, 47.6669326, -122.0383308, 124, 284, 42
45 Wed Jun 15 08:19:13 PDT 2022, 47.6671585, -122.0396368, 112, 285, 44
46 Wed Jun 15 08:19:17 PDT 2022, 47.6673408, -122.040649, 109, 285, 43
47 Wed Jun 15 08:19:22 PDT 2022, 47.6675545, -122.0419251, 118, 284, 42
48 Wed Jun 15 08:19:27 PDT 2022, 47.6678039, -122.0431766, 124, 285, 43
49 Wed Jun 15 08:19:32 PDT 2022, 47.668025, -122.0444401, 135, 284, 43
```

The app logs your location every 5 seconds and records a CSV-file in the Documents-folder of your device with the following columns:

Date / Time, Latitude, Longitude, Altitude, Bearing and Speed



The screenshot shows the Microsoft Visual Studio IDE interface with the following details:

- File Menu:** File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help.
- Search Bar:** Search (Ctrl+Q).
- Solution Explorer:** Shows the project "IoT-Central-Device-Sim-02".
- Toolbox:** Standard development tools.
- Code Editor:** The main window displays the file "Program.cs" with the following code:

```
1  using Microsoft.Azure.Devices.Client;
2  using Microsoft.Azure.Devices.Provisioning.Client;
3  using Microsoft.Azure.Devices.Provisioning.Client.Transport;
4  using Microsoft.Azure.Devices.Shared;
5  using System;
6  using System.Text;
7  using System.Threading;
8  using System.Threading.Tasks;
9
10 namespace IoT_Central_Device_Sim_02
11 {
12     internal class Program
13     {
14         public static async Task Main(string[] args)
15         {
16             //string deviceID = "your IoT Central device ID";
17             string deviceID = args[0];
18             Console.WriteLine("Device ID: " + args[0]);
19             //string devicePK = "your IoT Central device primary key";
20             string devicePK = args[1];
21             Console.WriteLine("SAS Token: " + args[1]);
22             //string deviceIdScope = "your device id scope";
23             string deviceIdScope = args[2];
24             Console.WriteLine("Device ID Scope: " + args[2]);
25             string deviceDPS = "global.azure-devices-provisioning.net";
26             int counter = 0;
27             //string fToReplay = @"C:\Users\...\Downloads\geolog_220610081526.csv";
28             string fToReplay = args[3];
29             Console.WriteLine("Replaying log-file: " + args[3]);
30             //int interval = 1000;
31             int interval = Convert.ToInt32(args[4]) * 1000;
32             Console.WriteLine("Replay Interval in seconds: " + args[4]);
33
34
35             using DeviceClient deviceClient = await SetupDeviceClientAsync(deviceID, deviceIdScope, devicePK, deviceDPS);
36             foreach (string line in System.IO.File.ReadLines(fToReplay))
37             {
38                 if (counter == 0)
```

A yellow callout box on the right side of the editor area contains the text: "To replay the data, you can use a .NET Core Console application."

Solution Explorer: Shows the project structure.

Properties: Shows file properties.

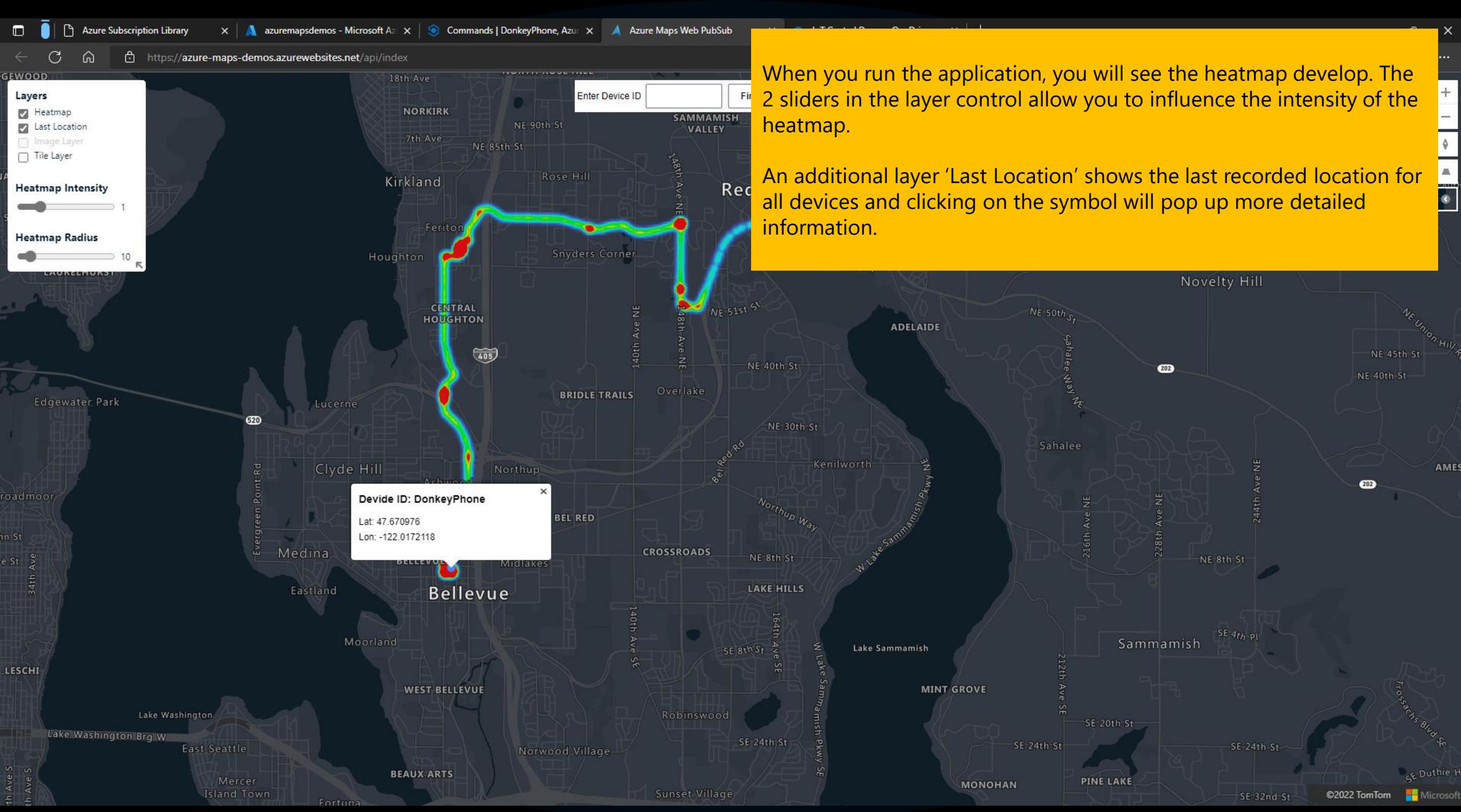
Output: Shows build output:

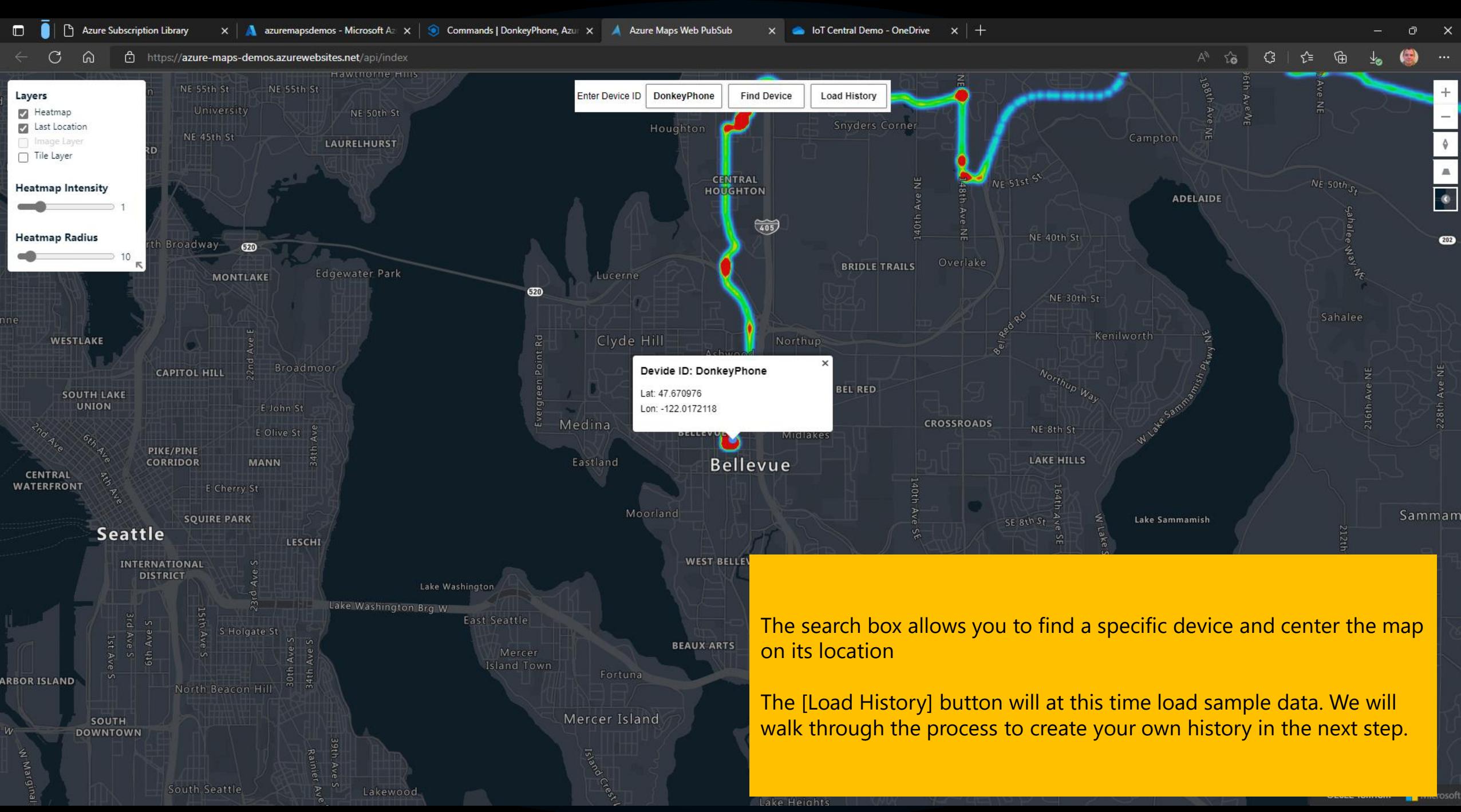
```
1>----- Build started: Project: IoT-Central-Device-Sim-02, Configuration: Debug Any CPU -----
1>IoT-Central-Device-Sim-02 -> C:\Users\jokebeck\source\repos\IoT-Central-Device-Sim-02\IoT-Central-Device-Sim-02\bin\Debug\netcoreapp3.1\IoT-Central-Device-Sim-02.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped ======
```

Bottom Status Bar: Build succeeded.

```
Telemetry item 8 sent - {"geolocation": {"lat": 47.6713759, "lon": -122.021965, "alt": 164}}
Telemetry item 9 sent - {"geolocation": {"lat": 47.6713955, "lon": -122.0220866, "alt": 162}}
Telemetry item 10 sent - {"geolocation": {"lat": 47.6713766, "lon": -122.0221806, "alt": 159}}
Telemetry item 11 sent - {"geolocation": {"lat": 47.6713593, "lon": -122.0222858, "alt": 157}}
Telemetry item 12 sent - {"geolocation": {"lat": 47.6713526, "lon": -122.0224111, "alt": 154}}
Telemetry item 13 sent - {"geolocation": {"lat": 47.6713528, "lon": -122.0225031, "alt": 152}}
Telemetry item 14 sent - {"geolocation": {"lat": 47.6713579, "lon": -122.0223671, "alt": 151}}
Telemetry item 15 sent - {"geolocation": {"lat": 47.6712123, "lon": -122.0222625, "alt": 150}}
Telemetry item 16 sent - {"geolocation": {"lat": 47.6707098, "lon": -122.0223145, "alt": 151}}
Telemetry item 17 sent - {"geolocation": {"lat": 47.6700076, "lon": -122.0228578, "alt": 152}}
Telemetry item 18 sent - {"geolocation": {"lat": 47.6694324, "lon": -122.0235459, "alt": 154}}
Telemetry item 19 sent - {"geolocation": {"lat": 47.6688695, "lon": -122.0242286, "alt": 155}}
Telemetry item 20 sent - {"geolocation": {"lat": 47.6682945, "lon": -122.02484, "alt": 155}}
Telemetry item 21 sent - {"geolocation": {"lat": 47.6677323, "lon": -122.0253458, "alt": 154}}
Telemetry item 22 sent - {"geolocation": {"lat": 47.6670378, "lon": -122.0264743, "alt": 151}}
Telemetry item 23 sent - {"geolocation": {"lat": 47.6666301, "lon": -122.0274738, "alt": 148}}
Telemetry item 24 sent - {"geolocation": {"lat": 47.6664631, "lon": -122.0288573, "alt": 143}}
Telemetry item 25 sent - {"geolocation": {"lat": 47.6662534, "lon": -122.0299755, "alt": 145}}
Telemetry item 26 sent - {"geolocation": {"lat": 47.6654725, "lon": -122.031084, "alt": 146}}
Telemetry item 27 sent - {"geolocation": {"lat": 47.6657311, "lon": -122.0324571, "alt": 149}}
Telemetry item 28 sent - {"geolocation": {"lat": 47.6650663, "lon": -122.0335459, "alt": 147}}
```

The application requires the following arguments which you can look up for the device you created earlier in IoT Central:
.\IoT-Central-Device-Sim-02.exe
 [Device ID]
 [Primary Key]
 [ID Scope]
 [File to Replay]
 [interval in seconds]





Azure Subscription Library | azuremapsdemos - Microsoft Azure | Commands | DonkeyPhone, Azur | Azure Maps Web PubSub | IoT Central Demo - OneDrive | +

https://azure-maps-demos.azurewebsites.net/api/index

Layers

- Heatmap
- Last Location
- Image Layer
- Tile Layer

Heatmap Intensity 1

Heatmap Radius 10

Similar there are also tile layers and...

Enter Device ID Find Device Load History

Greenwood Ave N
N 56th St
Phinney Avenue North
N Argyle Pl
55th St
N 55th St
Earth N
54th St
N 54th St
1st Ave NW
Greenwood Ave N
Kerron Rd Park S
N 53rd St
Birch Drk
North Meadow
MAIN LOG
Otter Lot
Stalls 801-1,300
Historic Carousel
Emu
Walaroo/wallaby
AUSTRALASIA
Critter Connections
Wildlife Theater
Gather + Graze Cafe
Trail of Vines
Tropical Asia
Meerkat Adaptations
Sloth Bear
Asian Small-clawed Otter
Tiger
Greater One-horned Rhinoceros
Komodo Dragon
Wart Hog
Lion
Assam Rhino Reserve
Tropical Asia
Rhino Encounter
Dusky Langur
Tapan
Slamang
Francis' Langur
Papuan New Guinea
Butterfly Garden
Open Enclosure
1899 Grove
CNC Administrative Offices
Marmoset
Pillnitzer Potato
Zoomezium's Backyard
Red Ruffed Lemur
Gorilla
Jaguar
Patas Monkey
Ostrich
Hippo
Giraffe
Giraffe Experience
African Savanna
Zebra
Gazelle
Beech Grove
Partula Shell
Backyard Habitat
Savanna Aviary
Family Farm presented by Child Readers Program
Lower Woodland Park
Woodland Park Trl
Aurora Ave N
99
99
Find Your Way
Each of our big orange directional signs has a letter in the lower right corner. Match those to the letters on your map to pinpoint your location.

©2022 TomTom Microsoft

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Commands | DonkeyPhone, Azur | Azure Maps Web PubSub | IoT Central Demo - OneDrive | +

https://azure-maps-demos.azurewebsites.net/api/index

Layers

- Heatmap
- Last Location
- Image Layer
- Tile Layer

Heatmap Intensity 1

Heatmap Radius 10

The image shows two maps side-by-side. On the left is a dark gray street map of Greenwood Ave and surrounding streets. A heatmap overlay is applied to this map, with intensity set to 1 and radius set to 10. On the right is a vibrant, colorful map of Woodland Park Zoo. This map features various animal exhibits like 'AUSTRALASIA', 'BANYAN WILDS', 'AFRICAN SAVANNA', and 'TRAIL OF VINES'. It includes directional signs with letters (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P) and icons for amenities like parking, restrooms, and food. A yellow callout box in the bottom-left corner provides context about the overlays.

...image overlays implemented that show up from zoom-levels 15 and higher for the Woodland Park Zoo. We will also walk through the steps to create your own tile layer or image overlay in the next steps.

Find Your Way
Each of our big orange directional signs has a letter in the lower right corner. Match those to the letters on your map to pinpoint your location.

©2022 TomTom Microsoft



Azure Subscription Library New container - Microsoft Azure Export | ExportToMap, Azure Maps Web PubSub Azure Maps Web PubSub IoT Central Demo - OneDrive

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/resourceGroups/IOTC/providers/Microsoft.Storage/storageAccounts/azuremapsdemos/

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Create a resource Home Dashboard All services FAVORITES All resources Azure Active Directory Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Monitor Advisor

azuremapsdemos | Storage browser (preview)

azuremapsdemos | Storage browser (preview)

Add container Upload Refresh Delete Change access level Restore containers Edit columns

Blob containers

Search containers by prefix

Showing all 4 items

	Name	Last modified	Public
<input type="checkbox"/>	azure-webjobs-hosts	6/15/2022, 9:59:13 AM	Private
<input type="checkbox"/>	azure-webjobs-secrets	6/15/2022, 9:59:08 AM	Private
<input type="checkbox"/>	function-releases	6/15/2022, 9:58:10 AM	Private
<input type="checkbox"/>	scm-releases	6/15/2022, 9:47:16 AM	Private

New container

Name * iotclogs

Public access level Private (no anonymous access)

Advanced

In its current state the application will not keep a history of locations and start with a fresh map when you close and re-open or refresh the browser window. To keep a history, you will create a new data export in IoT Central and this time write to Azure Blob Storage.

In the Azure Portal navigate to the storage account and create a new private blob container [iotclogs].

Create Discard

Microsoft Azure (Preview) [Report a bug](#)

Create a resource [Home](#) [Dashboard](#) [All services](#) [FAVORITES](#) [All resources](#) [Azure Active Directory](#) [Resource groups](#) [App Services](#) [Function App](#) [SQL databases](#) [Azure Cosmos DB](#) [Virtual machines](#) [Load balancers](#) [Storage accounts](#) [Virtual networks](#) [Monitor](#) [Advisor](#)

azuremapsdemos | Storage browser (preview)

azuremapsdemos | Storage account

Search (Ctrl+ /) [Overview](#) [Favorites](#) [Recently viewed](#) [Add container](#) [Upload](#) [Refresh](#) [Delete](#) [Change access level](#) [Restore containers](#)

Blob containers

Showing all 5 items

Name	Last modified
azure-webjobs-hosts	6/15/2022, 9:45:44 AM
azure-webjobs-secrets	6/15/2022, 9:45:44 AM
function-releases	6/15/2022, 9:45:44 AM
iotclogs	6/15/2022, 4:45:44 PM
scm-releases	6/15/2022, 9:45:44 AM

[View all](#) [File shares](#) [Queues](#) [Tables](#)

New container

Name [Create](#)

Public access level [Blob \(anonymous read access for blobs only\)](#)

Warning: Blobs within the container can be read by anonymous request, but container data is not available. Anonymous clients cannot enumerate the blobs within the container.

Advanced

>Create a 2nd new blob container [public] and grant anonymous read access for blobs only.

You will later create another Azure function that periodically looks for new data exports from IoT Central in the first folder, parses the data into a GeoJSON format and then writes it to that public container.

[Create](#) [Discard](#)

Settings

Microsoft Azure (Preview)  

Home > Resource groups > IOTC > azuremapsdemos

azuremapsdemos | Resource sharing (CORS)

Storage account

Save Discard

CORS is an HTTP feature that enables a web application running under one domain to access resources in another domain. Web browsers implement a security restriction known as same-origin policy that prevents a web page from calling APIs in a different domain. CORS provides a secure way to allow one domain (the origin domain) to call APIs in another domain.

You can set CORS rules individually for each of the storage services (i.e. blob, file, queue, table). Once you set the CORS rules for the service, then a properly authenticated request made against the service from a different domain will be evaluated to determine whether it is allowed according to the rules you have specified.

Learn more about CORS support for Azure Storage

Settings

Blob service **File service** **Queue service** **Table service**

Allowed origins	Allowed methods	Allowed headers	Exposed headers	Max age
*	GET			0
	0 selected			0

Resource sharing (CORS)

Advisor recommendations

Endpoints

Locks

Monitoring

Insights

Alerts

While you are in the storage account enable CORS.

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps Web PubSub | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4

Azure Maps Demos

Save Delete Rename

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export: Telemetry

Export the data if: all of the conditions are true

Name*: Sensors / Location / Latitude Operator*: Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination *	Data transformation	Export status	Details
AzureFunction	Edit	Healthy	X

+ Destination

Search for devices

Now go to IoT Central and create another data export with the same transformation as before.

IoT Central Home

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4

Azure Maps Demos

Save Delete Rename

Data

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export

Telemetry

Export the data if all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in the output.

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

Destination * AzureFunction Data transformation Export status Details

Edit

+

Destination

+

IoT Central Home

As the destination you choose this time Azure Blob Storage. You will need to provide a connection string which you can retrieve from the Azure Portal and the name of the container (here: iotlogs).

New destination

To create a new destination, select a destination type and enter the connection information. [Learn more](#)

Destination name * AzureStorage

Destination type * Azure Blob Storage

Authorization

Connection string

Connection string * DefaultEndpointsProtocol=https;AccountName=azur...
Container * iotlogs

Create Cancel

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps | Azure Maps Web PubSub | IoT Central Demo - OneDrive

<https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4>

Azure Maps Demos

Save Delete Rename

Data
All of your devices will export Telemetry

Connect Devices Device groups Device templates

Analyze Data explorer Dashboards

Manage Jobs

Ext

As a reminder here the transformation rule:

```
{  
  deviceId: .device.id,  
  enqueuedTime: .enqueuedTime,  
  telemetry: .telemetry | map({ key: .name, value: .value }) | from_entries,  
}
```

Search Set Destinations

AzureStorage

Add Cancel

IoT Central Home

Destination

Data transformation

This is an advanced feature, we recommend you start by visiting the [data transformation guide](#). Transformations change the shape of your exported messages into a new format.

1. Add your input message IoT Plug and Play mobile

```
1 {  
2   "applicationId": "ed3027c7-5a10-498d-a6f9-e612e80e542b",  
3   "enqueuedTime": "1951-11-01T22:36:41.310608068Z",  
4   "messageSource": "telemetry",  
5   "component": "sensors",  
6   "telemetry": [  
7     {  
8       "name": "battery",  
9       "value": -279968670  
10    },  
11    {  
12      "name": "accelerometer"  
13    },  
14    {  
15      "name": "gyroscope"  
16    },  
17  ]
```

2. Build transformation query

```
5 # Here is a sample query to find and assign the value for capability name  
6 # import 'iotc' as iotc;  
7 # { RangeOfMotion: .telemetry | iotc::find(.name == 'RangeOfMotion').val  
8 {  
9   deviceId: .device.id,  
10  enqueuedTime: .enqueuedTime,  
11  telemetry: .telemetry | map({ key: .name, value: .value }) | from_en
```

3. Preview output message(s)

```
1 {  
2   "deviceId": "epobbf2sc45h",  
3   "enqueuedTime": "1951-11-01T22:36:41.310608068Z",  
4   "telemetry": {  
5     "accelerometer": null,  
6     "barometer": 5.50584578587443e+307,  
7     "battery": -279968670,  
8     "geolocation": null,  
9     "gyroscope": null,  
10    "magnetometer": null  
11  }  
12 }
```

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps Web PubSub | Azure Maps Web PubSub

https://azure-maps-demos.azureiotcentral.com/data-export/exports/e0c21df1-a347-4ff0-aa6d-c36ad0ebf5e4

Azure Maps Demos

Search for devices

Save Delete Rename

Connect

Devices

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

Rules

Data export

Security

Permissions

Settings

Application

Customization

IoT Central Home

telemetry

Export the data if all of the conditions are true

Name * Sensors / Location / Latitude Operator * Exists

+ Filter + Message property filter

Enrichments

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

+ Custom string + Property

Destinations

Select destinations for your export. If you can't find your destination, [create a new one](#).

✓ Data transformation has been added for exporting to AzureStorage. Please save this export to save these changes.

Destination *	Data transformation	Export status	Details
AzureFunction	Edit	✓ Healthy	X
AzureStorage	Edit	⌚ Starting	X

+ Destination

Once the 2nd export is saved and healthy...

> PowerShell

X + ✓

```
...start the simulator application again  
  
.\\IoT-Central-Device-Sim-02.exe  
    "[Device ID]"  
    "[Primary Key]"  
    "[ID Scope]"  
    "[File to Replay]"  
    [interval in seconds]
```

```
Telemetry item 8 sent - {"geolocation": {"lat": 47.6713759, "lon": -122.021965, "alt": 164}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 9 sent - {"geolocation": {"lat": 47.6713955, "lon": -122.0220866, "alt": 162}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 10 sent - {"geolocation": {"lat": 47.6713766, "lon": -122.0221806, "alt": 159}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 11 sent - {"geolocation": {"lat": 47.6713593, "lon": -122.0222858, "alt": 157}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 12 sent - {"geolocation": {"lat": 47.6713526, "lon": -122.0224111, "alt": 154}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 13 sent - {"geolocation": {"lat": 47.6713528, "lon": -122.0225031, "alt": 152}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 14 sent - {"geolocation": {"lat": 47.6713579, "lon": -122.0223671, "alt": 151}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 15 sent - {"geolocation": {"lat": 47.6712123, "lon": -122.0222625, "alt": 150}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 16 sent - {"geolocation": {"lat": 47.6707098, "lon": -122.0223145, "alt": 151}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 17 sent - {"geolocation": {"lat": 47.6700076, "lon": -122.0228578, "alt": 152}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 18 sent - {"geolocation": {"lat": 47.6694324, "lon": -122.0235459, "alt": 154}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 19 sent - {"geolocation": {"lat": 47.6688695, "lon": -122.0242286, "alt": 155}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 20 sent - {"geolocation": {"lat": 47.6682945, "lon": -122.02484, "alt": 155}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 21 sent - {"geolocation": {"lat": 47.6677323, "lon": -122.0253458, "alt": 154}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 22 sent - {"geolocation": {"lat": 47.6670378, "lon": -122.0264743, "alt": 151}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 23 sent - {"geolocation": {"lat": 47.6666301, "lon": -122.0274738, "alt": 148}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 24 sent - {"geolocation": {"lat": 47.6664631, "lon": -122.0288573, "alt": 143}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 25 sent - {"geolocation": {"lat": 47.6662534, "lon": -122.0299755, "alt": 145}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 26 sent - {"geolocation": {"lat": 47.6660498, "lon": -122.031084, "alt": 146}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 27 sent - {"geolocation": {"lat": 47.6657006, "lon": -122.0324571, "alt": 149}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}  
Telemetry item 28 sent - {"geolocation": {"lat": 47.6650663, "lon": -122.0335459, "alt": 147}, "id_scope": "[Device ID]", "primary_key": "[Primary Key]", "file_to_replay": "[File to Replay]", "interval": [interval in seconds]}
```

Azure Subscription Library | azuremapsdemos - Microsoft Azure | Export | ExportToMap, Azure Maps | Azure Maps Web PubSub | IoT Central Demo - OneDrive | +

https://ms.portal.azure.com/#@microsoft.onmicrosoft.com/resource/subscriptions/2aa49947-b38a-4a9c-957b-8c551c321ba8/resourceGroups/IOTC/providers/Microsoft.Storage/storageAccounts/azuremapsdemos/...

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+ /)

Home > Resource groups > IOTC > azuremapsdemos

azuremapsdemos | Storage browser (preview)

Storage account

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Azure Active Directory

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

Monitor

Advisor

Microsoft Defender for Cloud

Cost Management + Billing

Help + support

Storage browser (preview)

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Data storage

Containers

File shares

Queues

Tables

Security + networking

Networking

Azure CDN

Access keys

Shared access signature

Encryption

Microsoft Defender for Cloud

Data management

Geo-replication

Data protection

Azure search

Settings

azuremapsdemos

Add Directory Upload Refresh Delete Copy Paste Rename Acquire lease Break lease Edit columns

Blob containers > iotlogs > ed3027c7-5a10-498d-a6f9-e612e80e542b > 0 > 2022 > 06 > 15 > 23 > 31

Authentication method: Access key (Switch to Azure AD User Account)

Search blobs by prefix (case-sensitive)

Only show active blobs

Showing all 1 items

	Name	Last modified	Access tier	Blob type	Size	Lease state
<input checked="" type="checkbox"/>	[..]					
<input checked="" type="checkbox"/>	dgdrztdypykjy	6/15/2022, 4:32:50 PM	-	Block blob	2.79 KiB	Available

You will see the exports showing up in the Storage browser in the Azure portal.

EXPLORER

... ● index.html ● dgdrztdypykjy 1 ●

C: > Users > jokebeck > Downloads > {} dgdrztdypykjy > {} telemetry > {} geolocation

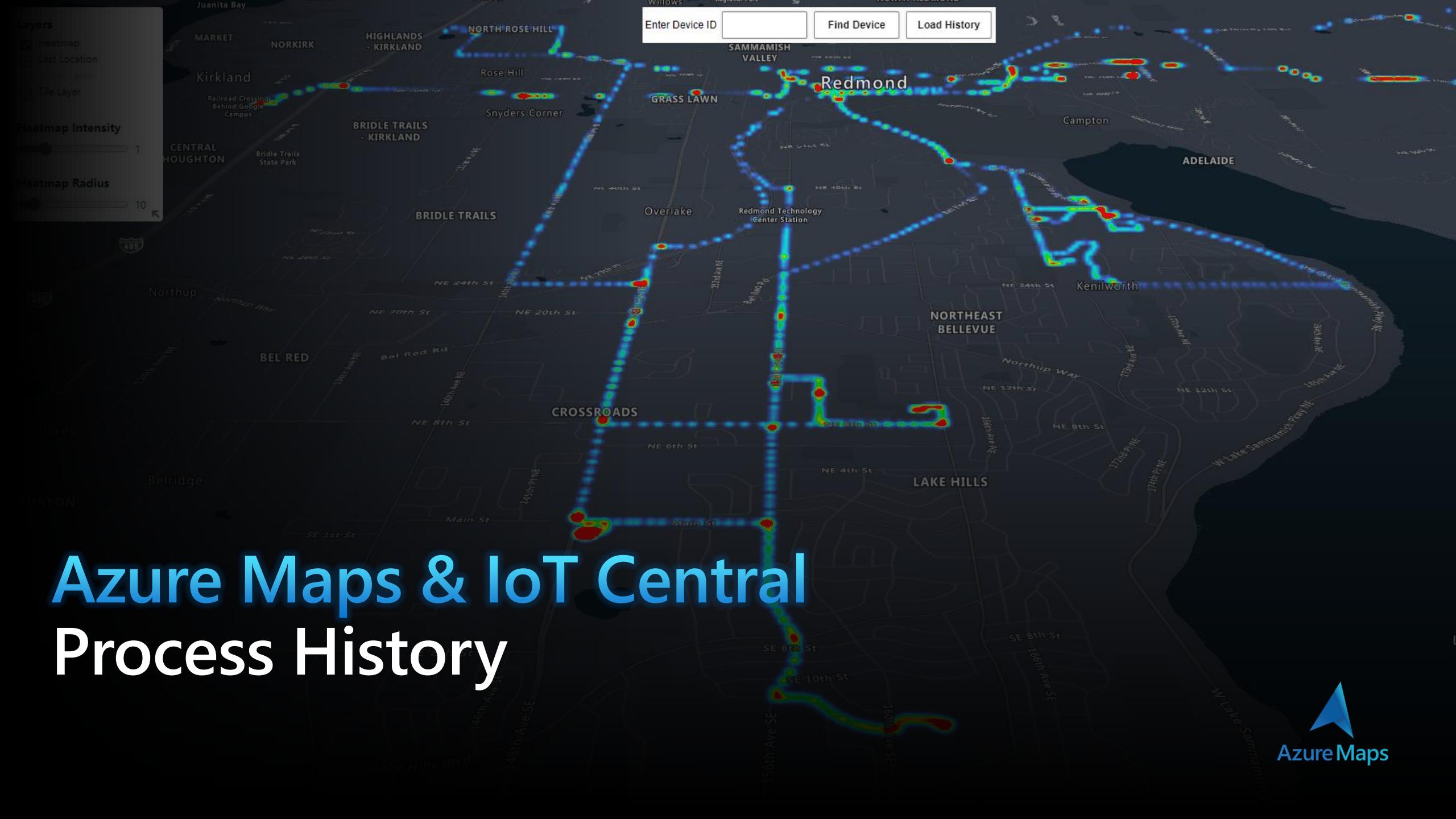
- > vscode
- > bin
- ✓ index
- {} function.json
- JS index.js
- > negotiate
- > notification
- > obj
- ↳ .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package.json

```
1  {
2      "deviceId": "DonkeyPhone",
3      "enqueuedTime": "2022-06-15T23:31:26.023Z",
4      "telemetry": [
5          "geolocation": [
6              "alt": 0,
7              "lat": 47.670976,
8              "lon": -122.0172118
9          ]
10     }
11 }
12 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:27.179Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6710336, "lon": -122.0171093}}}
13 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:28.429Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6709979, "lon": -122.0170445}}}
14 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:29.773Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.671201, "lon": -122.0169701}}}
15 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:30.866Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713873, "lon": -122.0170626}}}
16 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:31.976Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713981, "lon": -122.0174528}}}
17 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:33.070Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.671378, "lon": -122.0180046}}}
18 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:34.163Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713759, "lon": -122.0184906}}}
19 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:35.273Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713955, "lon": -122.0189788}}}
20 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:36.366Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713766, "lon": -122.0196041}}}
21 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:37.460Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713593, "lon": -122.020322}}}
22 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:38.570Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713526, "lon": -122.0209113}}}
23 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:39.679Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713528, "lon": -122.021431}}}
24 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:40.789Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6713579, "lon": -122.0217345}}}
25 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:41.929Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6712123, "lon": -122.0219019}}}
26 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:43.211Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6707098, "lon": -122.021965}}}
27 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:44.336Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6700076, "lon": -122.0220866}}}
28 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:45.429Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6694324, "lon": -122.0221806}}}
29 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:46.539Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6688695, "lon": -122.0222858}}}
30 {"deviceId": "DonkeyPhone", "enqueuedTime": "2022-06-15T23:31:47.632Z", "telemetry": {"geolocation": {"alt": 0, "lat": 47.6682945, "lon": -122.0224111}}}
31
```

The export contains JSON objects with one line per telemetry record.

OUTLINE

TIMELINE



Azure Maps & IoT Central Process History



Azure Maps Web PubSub</title>
<link rel="shortcut icon" href="https://donkeyiotfuncstg.blob.core.windows.net/public/icon.png" type="image/x-icon">
<meta charset="utf-8">
<meta http-equiv="x-ua-compatible" content="IE=Edge">
<meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
!-- Load the JavaScript and CSS files for the Azure Maps Web SDK. -->
<link rel="stylesheet" href="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.css" />
<script src="https://atlas.microsoft.com/sdk/javascript/mapcontrol/2/atlas.js" />
!-- Load the JavaScript and CSS files that has our custom control. -->
<link rel="stylesheet" href="https://donkeyiotfuncstg.blob.core.windows.net/public/azur...>
<script src="https://donkeyiotfuncstg.blob.core.windows.net/public/azur...>
<style>...</style>
</head>
<body onload="InitMap()">
 <div id="myMap"></div>
 <div class="controlContainer">...</div>

<script>
 //
 // Begin Edits
 //
 var mapKey = '...';
 var urlHistory = 'https://donkeyiotfuncstg.blob.core.windows.net/public/lochistory.json';
 //
 // End Edits
 //

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> npm install @azure/storage-blob

Now that you persist the telemetry data in a storage account, you need to process it in a way that the map can read it. For this demo you will create a GeoJSON-file. The idea here is to periodically process the data export with a timer trigger.

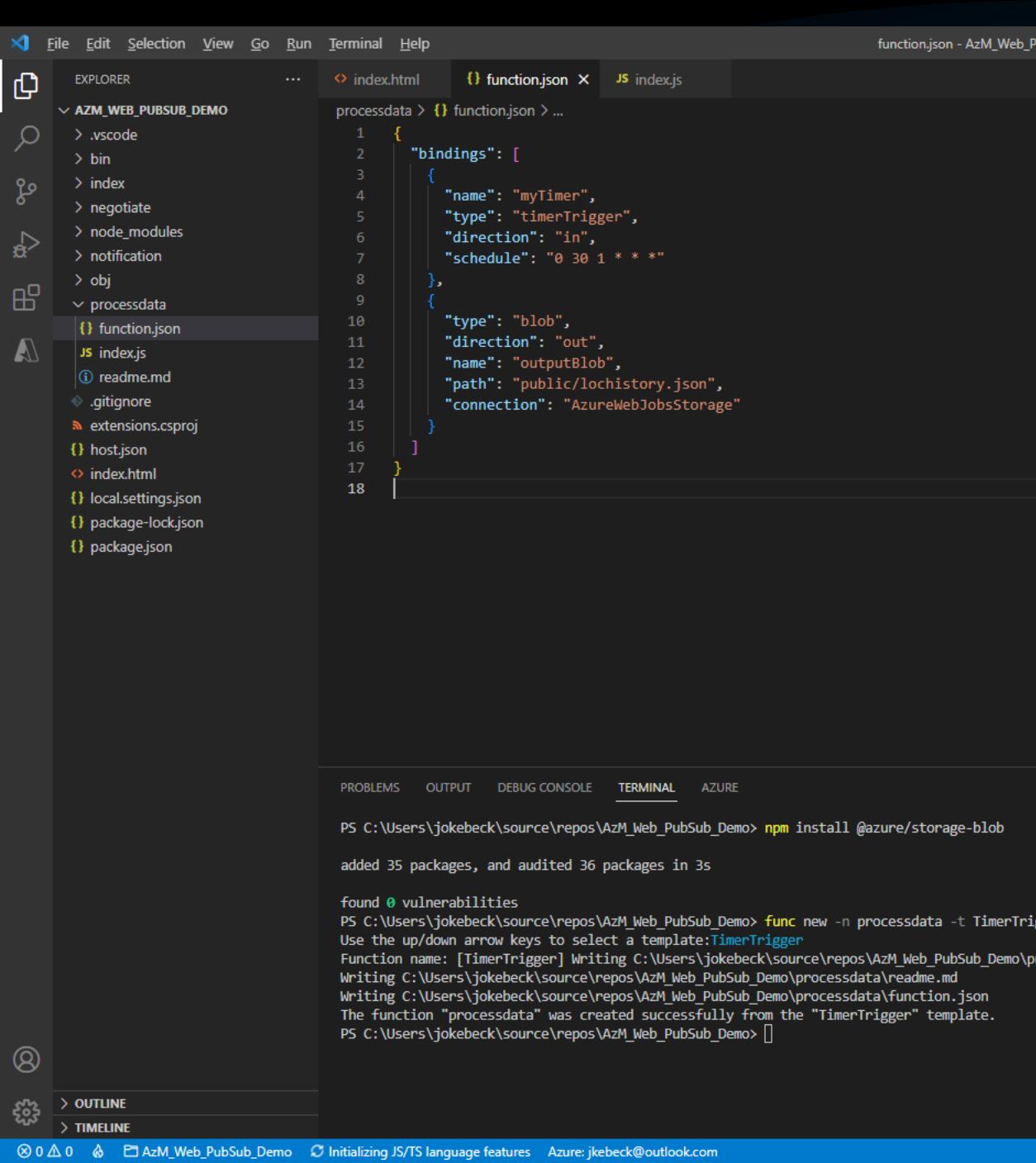
Open the project with your Azure Function with Visual Studio Code and open a Terminal window. Execute the following command to install the NPM package required for the Azure Blob Storage:

```
npm install @azure/storage-blob
```

Create a new Azure Function:
func new -n processdata -t TimerTrigger

The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer:** Shows the project structure under "AZM_WEB_PUBSUB_DEMO".
- Editor:** The "index.html" file is open, displaying its content. A yellow box highlights the command "func new -n processdata -t TimerTrigger" in the terminal below.
- Terminal:** The terminal window at the bottom shows the command being run: "PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n processdata -t TimerTrigger".



File Edit Selection View Go Run Terminal Help

function.json - AzM_Web_PubS

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- > index
- > negotiate
- > node_modules
- > notification
- > obj
- processdata
 - function.json
 - index.js
 - readme.md
 - .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package-lock.json
- package.json

processdata > {} function.json > ...

```
1  {
2    "bindings": [
3      {
4        "name": "myTimer",
5        "type": "timerTrigger",
6        "direction": "in",
7        "schedule": "0 30 1 * * *"
8      },
9      {
10        "type": "blob",
11        "direction": "out",
12        "name": "outputBlob",
13        "path": "public/lochistory.json",
14        "connection": "AzureWebJobsStorage"
15      }
16    ]
17  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> npm install @azure/storage-blob
added 35 packages, and audited 36 packages in 3s

found 0 vulnerabilities
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n processdata -t TimerTrigger
Use the up/down arrow keys to select a template:TimerTrigger
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\readme.md
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\function.json
The function "processdata" was created successfully from the "TimerTrigger" template.
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> []
```

OUTLINE

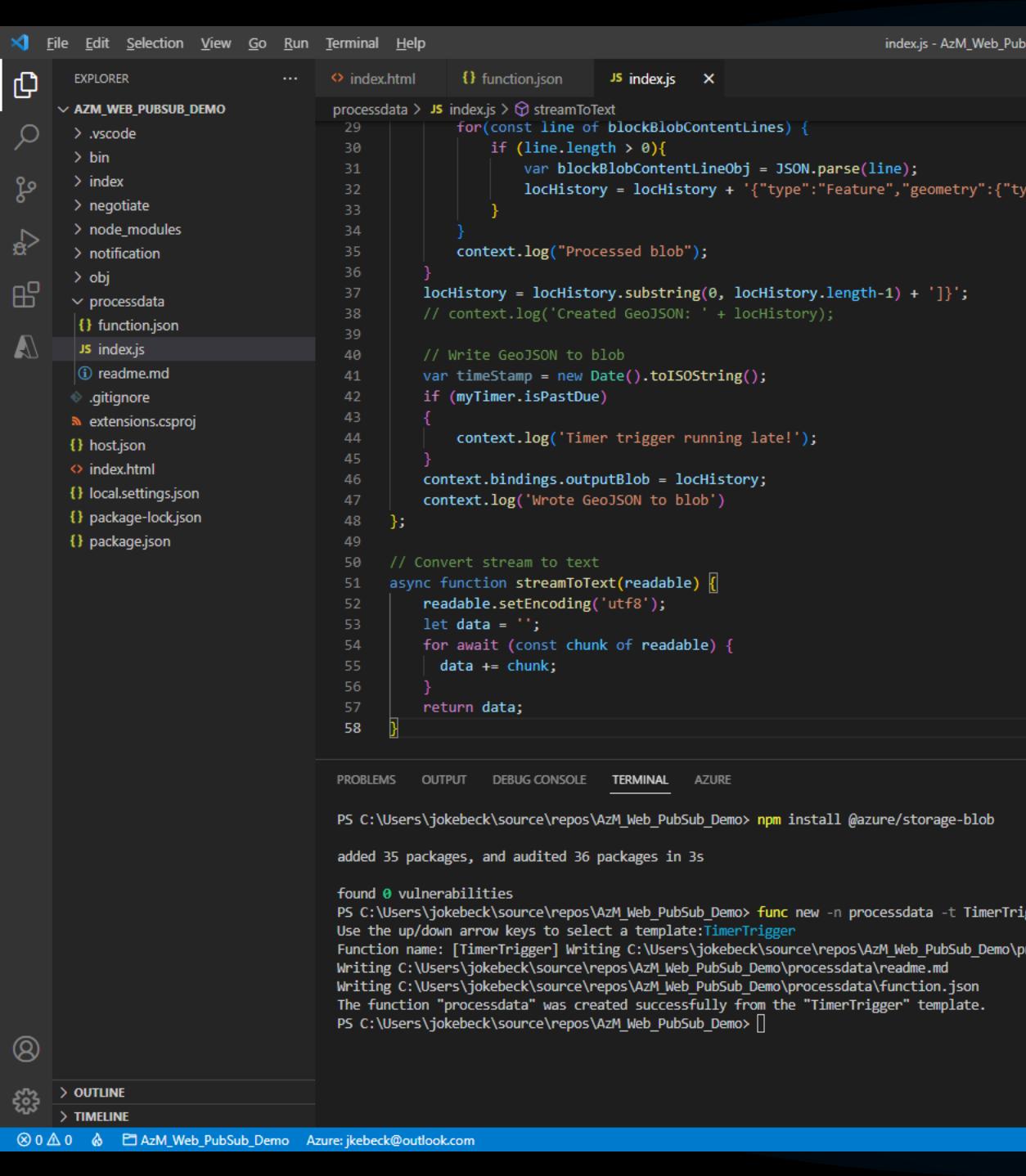
TIMELINE

0 ▲ 0 AzM_Web_PubSub_Demo Initializing JS/TS language features Azure:jkebeck@outlook.com

Replace processdata/function.json with the following code:

```
{
  "bindings": [
    {
      "name": "myTimer",
      "type": "timerTrigger",
      "direction": "in",
      "schedule": "0 30 1 * * *"
    },
    {
      "type": "blob",
      "direction": "out",
      "name": "outputBlob",
      "path": "public/lochistory.json",
      "connection": "AzureWebJobsStorage"
    }
  ]
}
```

Replace processdata/index.js with the code in the slide-notes



The screenshot shows the VS Code interface with the following details:

- File Explorer:** Shows the project structure under "AZM_WEB_PUBSUB_DEMO".
- Editor:** The "index.js" file is open, displaying the provided code.
- Terminal:** The terminal shows the command `npm install @azure/storage-blob` being run, followed by output indicating 35 packages were added and audited in 3 seconds.
- Status Bar:** Shows the path "AzM_Web_PubSub_Demo" and the email "Azure:jkebeck@outlook.com".

```
processdata > JS index.js > streamToText
  29     for(const line of blockBlobContentLines) {
  30         if (line.length > 0){
  31             var blockBlobContentLineObj = JSON.parse(line);
  32             locHistory = locHistory + '{"type":"Feature","geometry":{"type":"Point","coordinates":['
  33         }
  34     }
  35     context.log("Processed blob");
  36 }
  37 locHistory = locHistory.substring(0, locHistory.length-1) + ']}}';
  38 // context.log('Created GeoJSON: ' + locHistory);
  39
  40 // Write GeoJSON to blob
  41 var timeStamp = new Date().toISOString();
  42 if (myTimer.isPastDue)
  43 {
  44     context.log('Timer trigger running late!');
  45 }
  46 context.bindings.outputBlob = locHistory;
  47 context.log('Wrote GeoJSON to blob')
  48 };
  49
  50 // Convert stream to text
  51 async function streamToText(readable) {
  52     readable.setEncoding('utf8');
  53     let data = '';
  54     for await (const chunk of readable) {
  55         data += chunk;
  56     }
  57     return data;
  58 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

```
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> npm install @azure/storage-blob
added 35 packages, and audited 36 packages in 3s

found 0 vulnerabilities
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> func new -n processdata -t TimerTrigger
Use the up/down arrow keys to select a template:TimerTrigger
Function name: [TimerTrigger] Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\function.json
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\readme.md
Writing C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo\processdata\function.json
The function "processdata" was created successfully from the "TimerTrigger" template.
PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo> []
```

> OUTLINE
> TIMELINE

A screenshot of the Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar shows "host.json - AzM_Web_PubSub_Demo". The left sidebar has icons for Explorer, Search, Open, Find, and Outline. The Explorer view shows a folder named "AZM_WEB_PUBSUB_DEMO" containing files like .vscode, bin, index, negotiate, node_modules, notification, obj, processdata, function.json, index.js, readme.md, .gitignore, extensions.csproj, host.json (which is selected), index.html, local.settings.json, package-lock.json, and package.json. The main editor area shows the "host.json" file with the following code:

```
1  {
2    "version": "2.0",
3    "extensionBundle": {
4      "id": "Microsoft.Azure.Functions.ExtensionBundle",
5      "version": "[3.3.0, 4.0.0)"
6    }
7 }
```

The bottom of the screen shows the terminal tab with the text "PS C:\Users\jokebeck\source\repos\AzM_Web_PubSub_Demo>". The status bar at the bottom includes icons for file operations, a progress bar, and the text "AzM_Web_PubSub_Demo Azure: jokebeck@outlook.com".

Replace host.json with the following code.

```
{
  "version": "2.0",
  "extensionBundle": {
    "id": "Microsoft.Azure.Functions.ExtensionBundle",
    "version": "[3.3.0, 4.0.0)"
  }
}
```

function.json - AzM_Web_PubSub_Demo

EXPLORER

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- > index
- > negotiate
- > node_modules
- > notification
- > obj
- processdata
- function.json
- index.js
- readme.md
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package-lock.json
- package.json

processdata > function.json > bindings > 1

```
1  {
2    "bindings": [
3      {
4        "name": "myTimer",
5        "type": "timerTrigger",
6        "direction": "in",
7        "schedule": "0 * * * *"
8      },
9      {
10        "type": "blob",
11        "direction": "out",
12        "name": "outputBlob",
13        "path": "public/lochistory.json",
14        "connection": "AzureWebJobsStorage"
15      }
16    ]
17  }
```

For testing purposes, you may want to reduce the timer to a shorter interval but don't forget to increase the interval again before you publish.

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

[2022-06-16T00:14:15.975Z] Worker process started and initialized.
[2022-06-16T00:14:16.973Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrztdypykjy
[2022-06-16T00:14:17.047Z] Downloaded blob content
[2022-06-16T00:14:17.052Z] Processed blob
[2022-06-16T00:14:17.054Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrztdypykjy
[2022-06-16T00:14:17.135Z] Downloaded blob content
[2022-06-16T00:14:17.140Z] Processed blob
[2022-06-16T00:14:17.142Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/33/dgdrztdypykjy
[2022-06-16T00:14:17.223Z] Downloaded blob content
[2022-06-16T00:14:17.225Z] Processed blob
[2022-06-16T00:14:17.229Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/34/dgdrztdypykjy
[2022-06-16T00:14:17.305Z] Downloaded blob content
[2022-06-16T00:14:17.307Z] Processed blob
[2022-06-16T00:14:17.308Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/35/dgdrztdypykjy
[2022-06-16T00:14:17.388Z] Downloaded blob content
[2022-06-16T00:14:17.390Z] Processed blob
[2022-06-16T00:14:17.392Z] Processing blob: ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/36/dgdrztdypykjy

Ln 13, Col 40 Spaces: 2 UTF-8 CRLF {} JSON Go Live

Microsoft Azure (Preview) [Report a bug](#) [Icons]

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azuremapsdemos | Storage browser (preview) [Icons]

[azuremapsdemos](#) [Icons] [Add Directory](#) [Upload](#) [Change access level](#) [Refresh](#) [Delete](#) [Copy](#) [Paste](#) [Rename](#) [Acquire lease](#) [Break lease](#) [Edit columns](#)

[Blob containers](#) > [public](#)

Authentication method: Access key (Switch to Azure AD User Account)

[Only show active blobs](#)

Showing all 1 items

| | Name | Last modified | Access tier | Blob type | Size | Lease state |
|--------------------------|---------------------------------|-----------------------|-------------|------------|-----------|-------------|
| <input type="checkbox"/> | lochistory.json | 6/15/2022, 5:15:01 PM | - | Block blob | 57.02 KiB | Available |

After the timer triggered function completes the processing you will see a file lochistory.json in the Azure blob container [public].

A screenshot of the Microsoft Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar shows 'index.html - AzM_Web_PubS'. The left sidebar has icons for Explorer, Search, Open, Find, and Outline. The Explorer view shows a project structure for 'AZM_WEB_PUBSUB_DEMO' with files like .vscode, bin, index, negotiate, node_modules, notification, obj, processdata (function.json, index.js, README.md), .gitignore, extensions.csproj, host.json, index.html, local.settings.json, package-lock.json, and package.json. The main code editor area displays 'index.html' with JavaScript code for initializing a map. The bottom status bar shows 'Function Runtime Version: 4.5.2.18383' and a log message: 'For detailed output, run func with --verbose flag. [2022-06-16T00:17:02.673Z] Executing 'Functions.processdata' (Reason='Timer fired at 2022-06-16T00:17:02.679Z') Trigger Details: UnscheduledInvocationReason: IsPastDue, OriginalS [2022-06-16T00:17:04.298Z] Worker process started and initialized.'

```
index.html
function.json
index.js
host.json

index.html > html > body > script > InitMap > map.events.add('ready') callback > tileUrl

103     var urlHistory = 'https://azuremapsdemos.blob.core.windows.net/pub...
104     // ...
105     // End Edits
106     //
107     var map;
108     var popup = null;
109     var dsHeatmap = new atlas.source.DataSource();
110     var lHeatmap = null;
111     var dsLastLoc = new atlas.source.DataSource();
112     var lLastLoc = null;

113     function InitMap()
114     {
115         map = new atlas.Map('myMap', {
116             center: [-122.33, 47.6],
117             zoom: 12,
118             language: 'en-US',
119             renderWorldCopies: false,
120             showBuildingModels: true,
121             showLogo: true,
122             showFeedbackLink: false,
123             style: 'grayscale_dark',
124             authOptions: {
125                 authType: 'subscriptionKey',
126                 subscriptionKey: mapKey
127             }
128         });
129
130         //Wait until the map resources are ready.
131         map.events.add('ready', function () {
132             // add map navigation and style controls
133         });
    }

    //Wait until the map resources are ready.
    map.events.add('ready', function () {
        // add map navigation and style controls
    });

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL AZURE

Function Runtime Version: 4.5.2.18383

Functions:

index: [GET,POST] http://localhost:7071/api/index
negotiate: http://localhost:7071/api/negotiate
notification: [GET,POST] http://localhost:7071/api/notification
processdata: timerTrigger

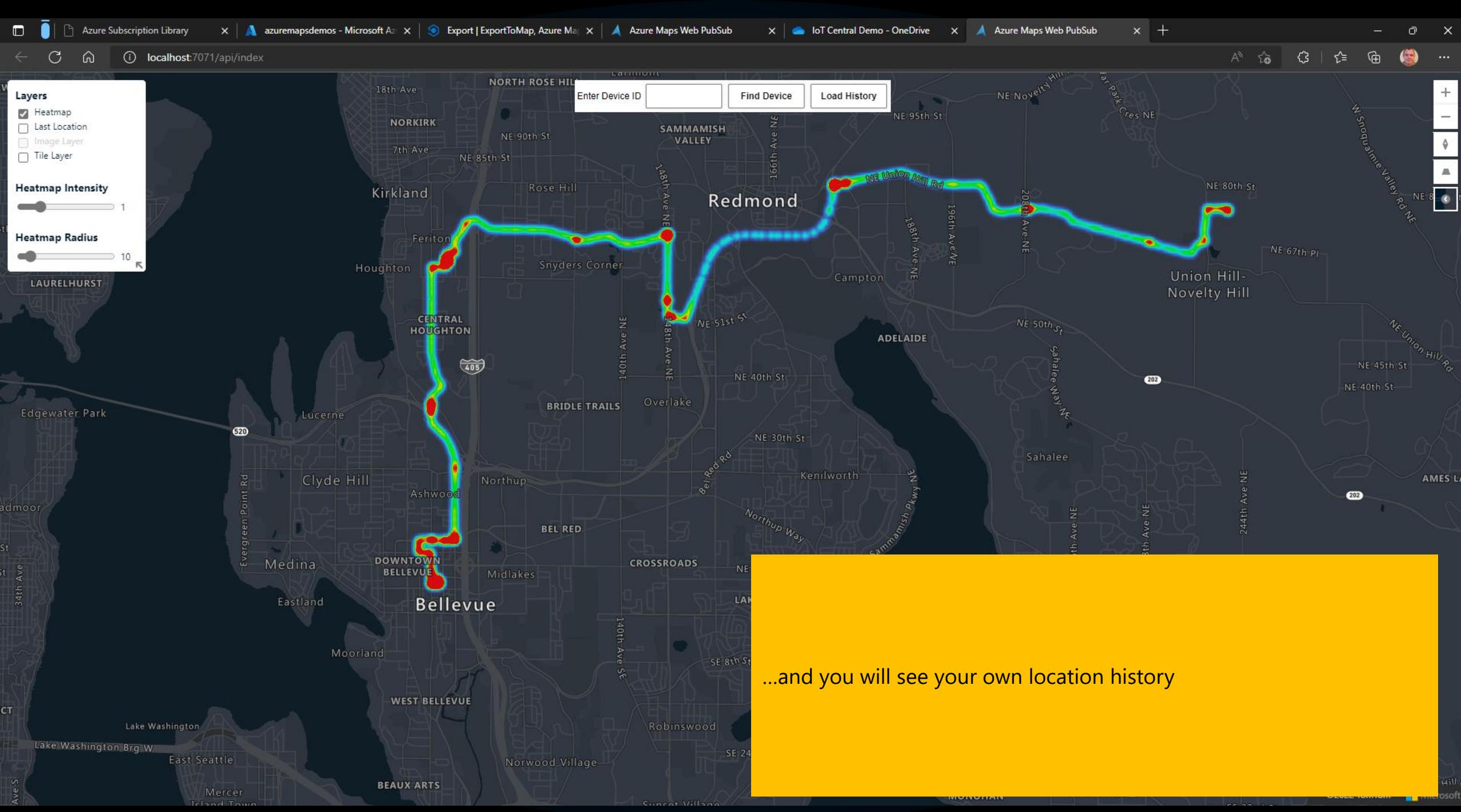
For detailed output, run func with --verbose flag.
[2022-06-16T00:17:02.673Z] Executing 'Functions.processdata' (Reason='Timer fired at 2022-06-16T00:17:02.679Z')
Trigger Details: UnscheduledInvocationReason: IsPastDue, OriginalS
[2022-06-16T00:17:04.298Z] Worker process started and initialized.
```

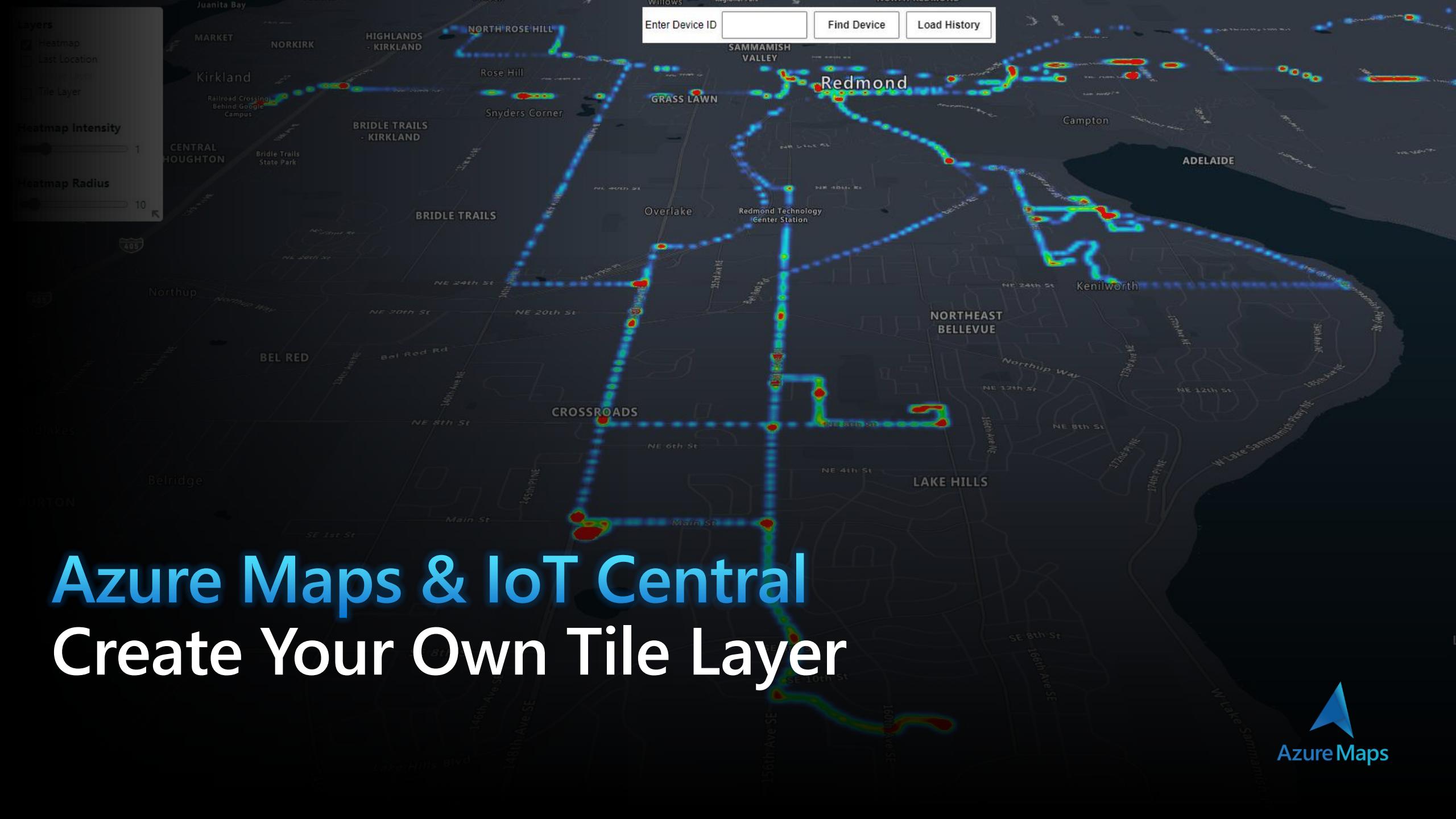
To use now your own history instead of the sample change the name of the storage account in the index.html of your Azure functions project.

Don't forget to change the timer interval to a longer period.

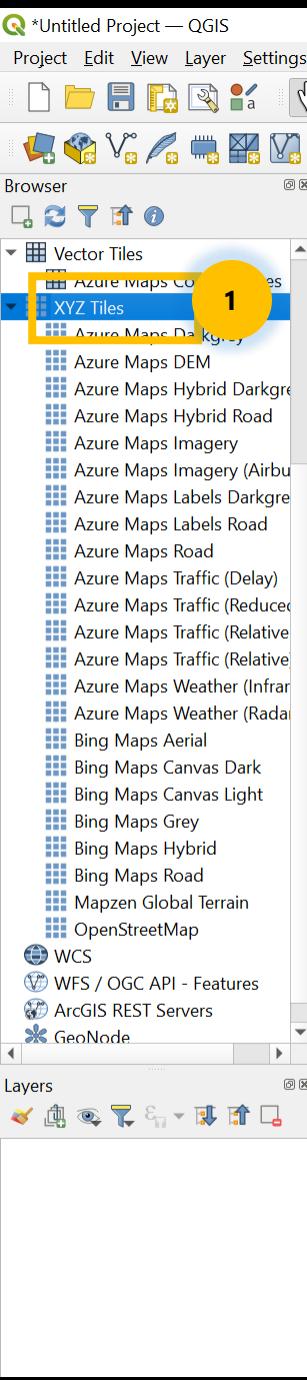
While you are here you may also want to upload the contents of the zip-file public.zip to your own storage account (container public) and change all occurrences of [azuremapsdemos] to the name of your storage account.

Republish the function again...





Azure Maps



You will create a tile layer from a PDF or image file. The first task is to geo-reference the image / PDF file. A good tool for the task is QGIS. To geo-reference the file you need a map and / or imagery as reference. You will use Azure Maps.

1. Open QGIS and right-click on [XYZ Tiles] in the browser panel.
2. Select [New Connection] from the context menu.
3. In the dialog that pop ups, give the layer a name.
4. Enter the URL pattern such as
`https://atlas.microsoft.com/map/tile?api-version=2.1&tilesetId=microsoft.imagery&zoom={z}&x={x}&y={y}&subscription-key=YOUR SUBSCRIPTION KEY`
replacing YOUR_SUBSCRIPTION_KEY with your Azure Maps Subscription Key.
If you want to add other tile sets replace the tilesetId with other **raster** tilesetIds. A list of tilesetIDs is [here](#).
5. Set the [Min Zoom Level] to 0
6. Set the [Max Zoom Level] to 19
7. Click [OK]

Repeat the steps for the tilesetId=microsoft.base.hybrid.road

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster 1 Web Mesh Processing Help

Browser

Layers

Coordinate -13554748,6014082 Scale 1:13356 Magnifier 100% Rotation 0.0 ° Render EPSG:3857

1. Double click the 2 newly created XYZ Tile connection in the browser panel to add the to the map canvas.

2. Open the [Raster] menu and select [Georeferencer...] from the drop-down menu

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

File Edit View Settings

1

Browser

Vector Tiles

- Azure Maps Contour Lines
- XYZ Tiles
- Azure Maps Darkgrey
- Azure Maps DEM
- Azure Maps Hybrid Darkgrey
- Azure Maps Hybrid Road
- Azure Maps Imagery
- Azure Maps Imagery (Airbus)
- Azure Maps Labels Darkgrey
- Azure Maps Labels Road
- Azure Maps Road
- Azure Maps Traffic (Delay)
- Azure Maps Traffic (Reduced)
- Azure Maps Traffic (Relative)
- Azure Maps Weather (Infrared)
- Azure Maps Weather (Radar)
- Bing Maps Aerial
- Bing Maps Canvas Dark
- Bing Maps Canvas Light
- Bing Maps Grey
- Bing Maps Hybrid
- Bing Maps Road
- Mapzen Global Terrain

Rattlesnake Lake

Layer

1. Click [Open Raster]

Georeferencer

P table

| Enabled | ID | Source X | Source Y | Dest. X | Dest. Y | dX (pixels) | dY (pixels) | Residual (pixels) |
|---------|----|----------|----------|---------|---------|-------------|-------------|-------------------|
|---------|----|----------|----------|---------|---------|-------------|-------------|-------------------|

Type to locate (Ctrl+K) rdi -13554397,6014190 1:13507 n 100% 0.0 ° ✓ Render EPSG: Delete point

Rotation 0.0 ° Transform: Not set 463.-2 EPSG:

The screenshot shows two QGIS windows side-by-side. The left window is the main QGIS interface with a satellite map of Rattlesnake Lake. The right window is the 'Georeferencer' plugin. A yellow circle highlights the 'Open Raster' button in the Georeferencer toolbar, which is step 1 of the process. The Georeferencer interface includes a table for managing georeferencing data.

Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain



1. Select the PDF or image you want to georeference.
2. Click on [Transformation Settings]



| Enabled | ID | Source X | Source Y | Dest. X | Dest. Y | dX (pixels) | dY (pixels) | Residual (pixels) |
|---------|----|----------|----------|---------|---------|-------------|-------------|-------------------|
| False | | | | | | | | |

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

File Edit View Settings

Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

Rattlesnake Lake

Transformation Parameters

Transformation type: Linear 1

Resampling method: Nearest Neighbour 2

Target SRS: EPSG:3857 - WGS 84 3

Output Settings

Output raster: Ledge_modified.tif ...

Compression: None

Save GCP points

Create world file only (linear transforms)

Use 0 for transparency when needed

Set target resolution

Horizontal: 0.00000 ...

Vertical: -1.00000 ...

Reports

Generate PDF map: ...

Generate PDF report: ...

Load in QGIS when done 4

OK 5 Cancel Help

Type to locate (Ctrl+K) rdi -13554397,6014190 1:13507 n 100% 0.0° Render EPSG: Raster loaded: C:/Users/jokebeck/On

rm: Not set 6.-260 None



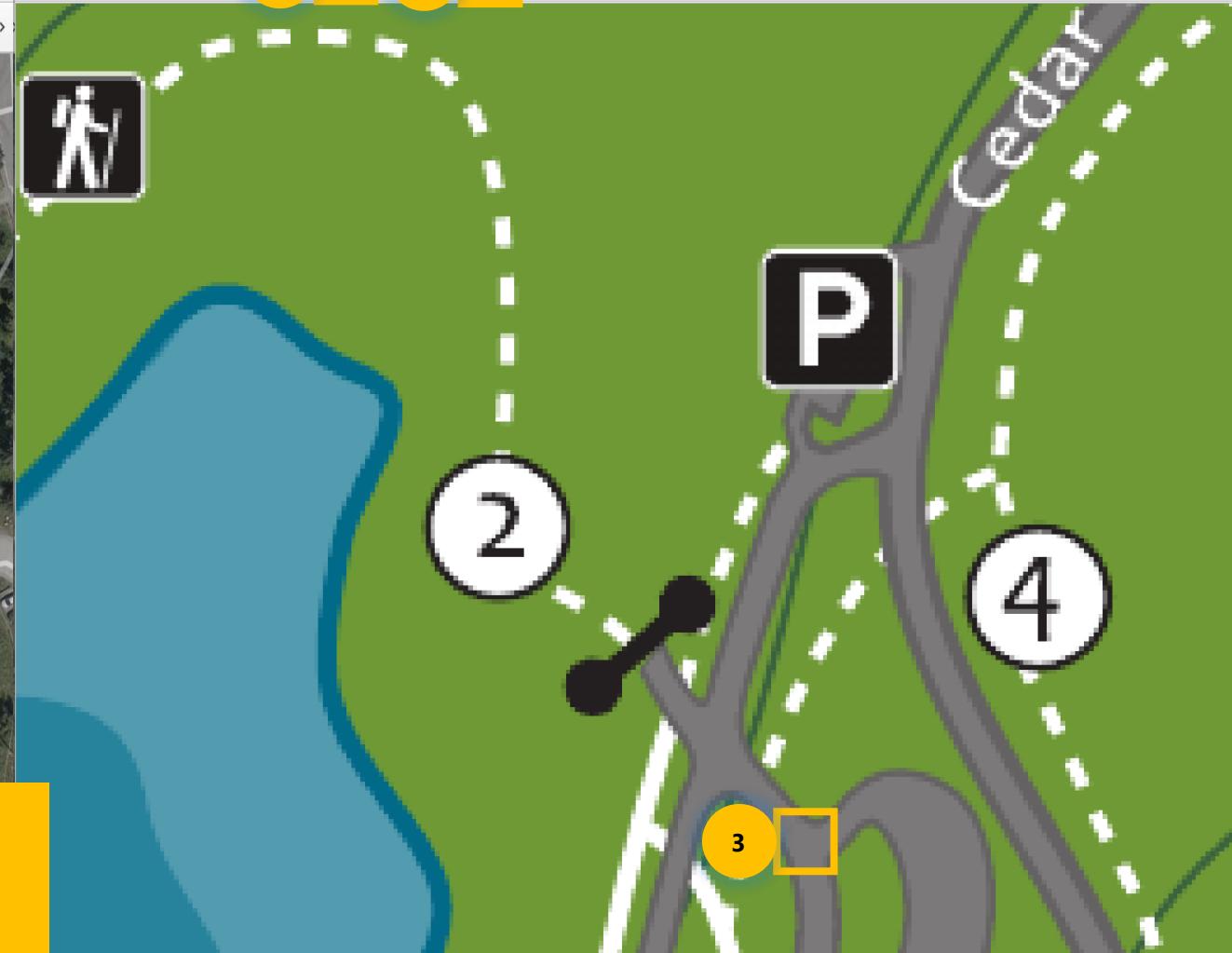
Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

Layer



1. Pan and zoom the map and georeferencer until you see matching areas in both windows.
2. Click on [Add Point].
3. Click on a recognizable point in the georeferencer.



| Enabled | ID | Source X | Source Y | Dest. X | Dest. Y | dX (pixels) | dY (pixels) | Residual (pixels) |
|---------|----|----------|----------|---------|---------|-------------|-------------|-------------------|
|---------|----|----------|----------|---------|---------|-------------|-------------|-------------------|

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
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 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

Layer

1. In the dialog that pops up click on [From Map Canvas].

Q Georeferencer - Rattlesnake-Ledge.pdf

File Edit View Settings

Enter Map Coordinates

Enter X and Y coordinates (DMS (*dd mm ss.ss*), DD (*dd.dd*) or projected coordinates (*mmmm.mmm*)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.

X / East

Y / North

EPSG:3857 - WGS 84 / Pseudo-Mercator

Automatically hide georeferencer window

OK 1 From Map Canvas Cancel

Type to locate (Ctrl+K) 13555201.1,6013451.7 1:1688 100% 0.0 ° 0.0 ° Transform: Linear Translation (0, 0) Scale (1, 1) Rotation: 0 982.0,-366.9 None

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

Layer

 - Click on the corresponding point in the map.
 - Click on [OK].

Q Georeferencer - Rattlesnake-Ledge.pdf

File Edit View Settings

Enter Map Coordinates

Enter X and Y coordinates (DMS (*dd mm ss.ss*), DD (*dd.dd*) or projected coordinates (*mmmm.mm*)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.

X / East -13555190.13031117431819439

Y / North 6013275.08807044103741646

EPSG:3857 - WGS 84 / Pseudo-Mercator

Automatically hide georeferencer window

2 OK From Map Canvas Cancel

Type to locate (Ctrl+K) 13555201.1,6013451.7 1:1688 100% 0.0 ° 0.0 ° Rotation Transform: Linear Translation (0, 0) Scale (1, 1) Rotation: 0 982.0,-366.9 None

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Browser

- Vector Tiles
 - Azure Maps Contour Lines
 - XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

Layer

1. The first point is added to the list of Ground Control Points (GCP).

Georeferencer - Rattlesnake-Ledge.pdf

File Edit View Settings

| ID | Source X | Source Y | Dest. X | Dest. Y | dX (pixels) | dY (pixels) | Residual (pixels) |
|----|-----------|-------------|--------------|------------|-------------|-------------|-------------------|
| 0 | 1011.7744 | -546.499491 | -13555190.13 | 6013275.09 | n/a | n/a | n/a |

Type to locate (Ctrl+K) 1:1688 agnifi 100% static 0.0 ° ✓ Re

Rotation 0.0 ° Transform: Linear Translation (0, 0) Scale (1, 1) Rotation: 0 963.5.-365.7 None

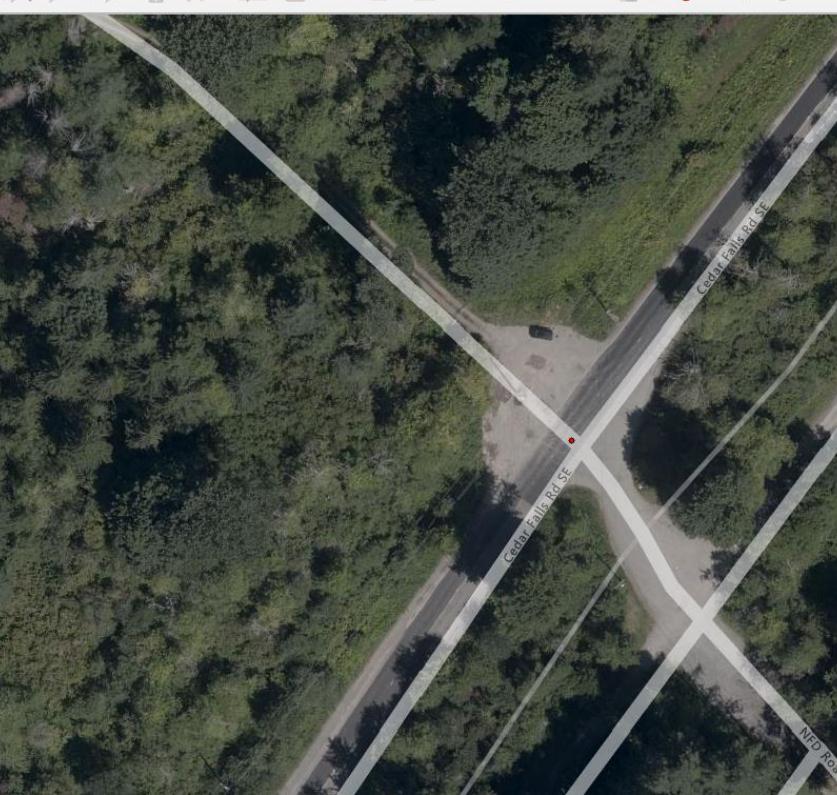


- Vector Tiles
 - Azure Maps Contour Lines
- XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbu
 - Azure Maps Labels Darkgre
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrar
 - Azure Maps Weather (Rada
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain

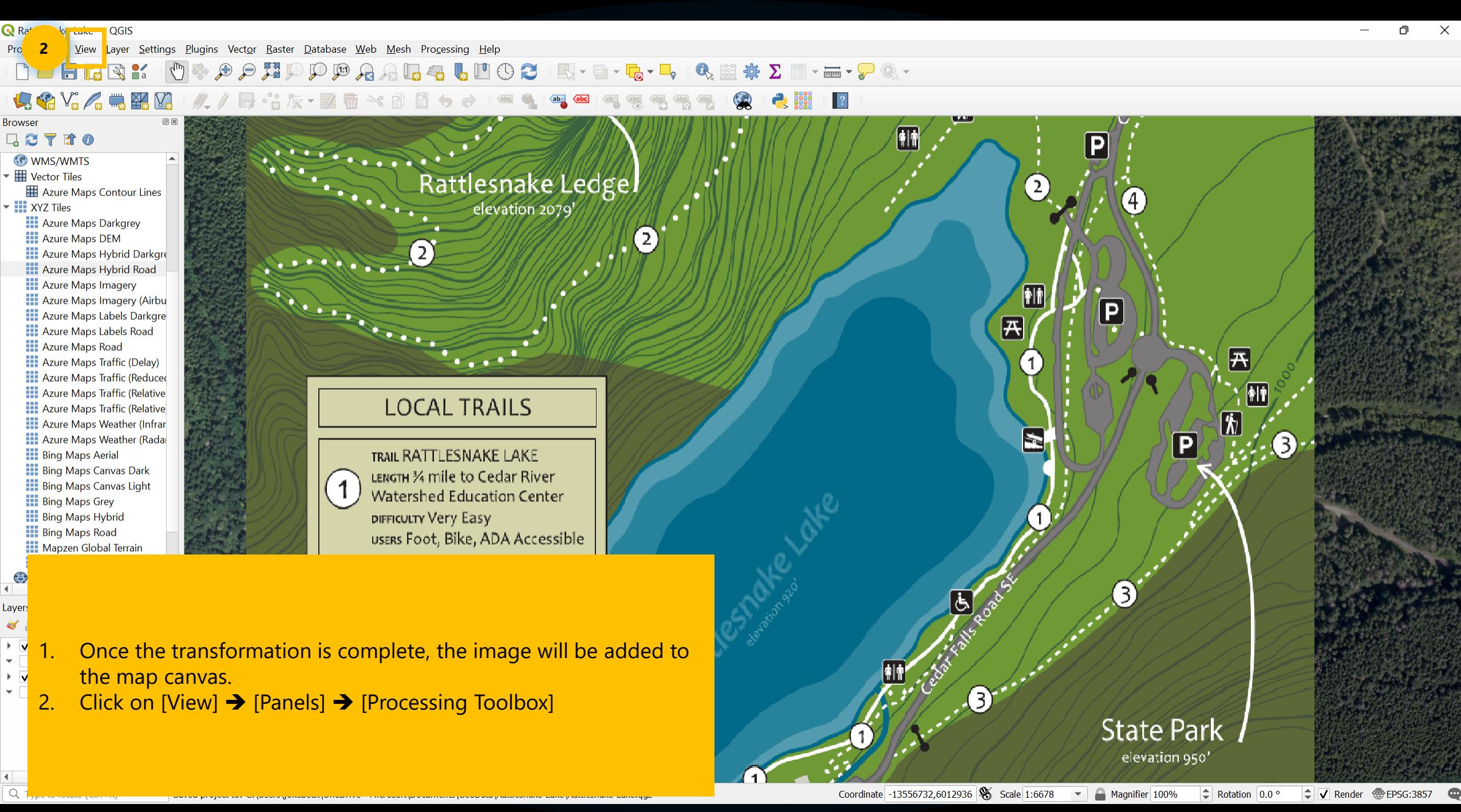


Layers

1. Repeat until you have 4 or 5 points (depending on the transformation you chose you may need at least 6).
2. Click [Start Georeferencing].



| ID | Source X | Source Y | Dest. X | Dest. Y | dX (pixels) | dY (pixels) | Residual (pixels) |
|----|------------|-------------|--------------|------------|-------------|-------------|-------------------|
| 0 | 1011.7744 | -546.499491 | -13555190.13 | 6013275.09 | 8.191317 | -1.370315 | 8.305145 |
| 1 | 520.092923 | -1276.9857 | -13556056.13 | 6011865.00 | -2.940614 | 8.805959 | 9.283972 |
| 2 | 1157.7457 | -762.095850 | -13554999.09 | 6012895.09 | -26.860098 | -17.371029 | 31.987771 |
| 3 | 813.820647 | -270.414333 | -13555540.94 | 6013776.88 | 2.460708 | 11.142222 | 11.410705 |
| 4 | 1166.4619 | -224.417643 | -13554904.84 | 6013887.96 | 19.148688 | -1.206837 | 19.186680 |





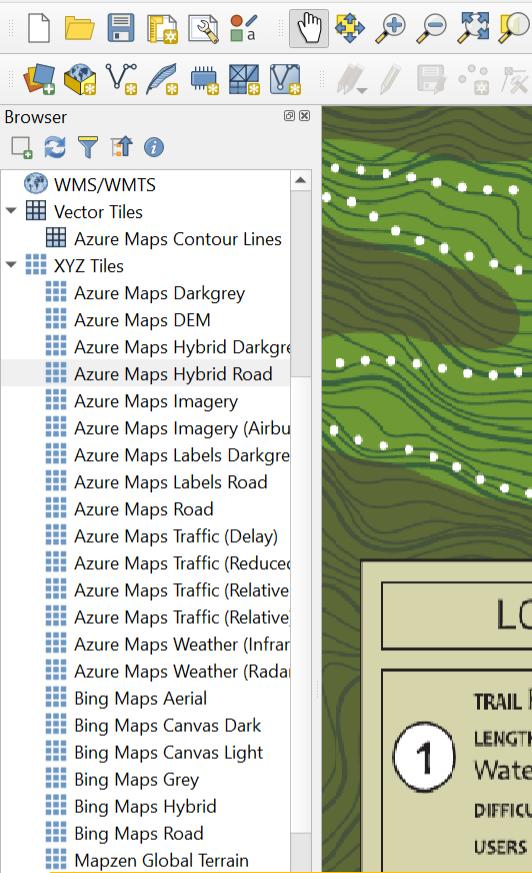
Browser

- WMS/WMTS
- Vector Tiles
 - Azure Maps Contour Lines
- XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain



Processing Toolbox

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
 - Convert map to raster
 - Fill NoData cells
 - Generate XYZ tiles (Directory) **1**
 - Generate XYZ tiles (Tiles)
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL
- GRASS
- SAGA



Generate XYZ Tiles (Directory)

Log

Extent

1



Minimum zoom

12

Maximum zoom

12

DPI

96

Background color [optional]

Generate XYZ tiles (Directory)

This algorithm generates raster

Calculate from Layer

Calculate from Layout Map

Calculate from Bookmark

Use Current Map Canvas Extent

Draw on Map Canvas

Cancel

Close

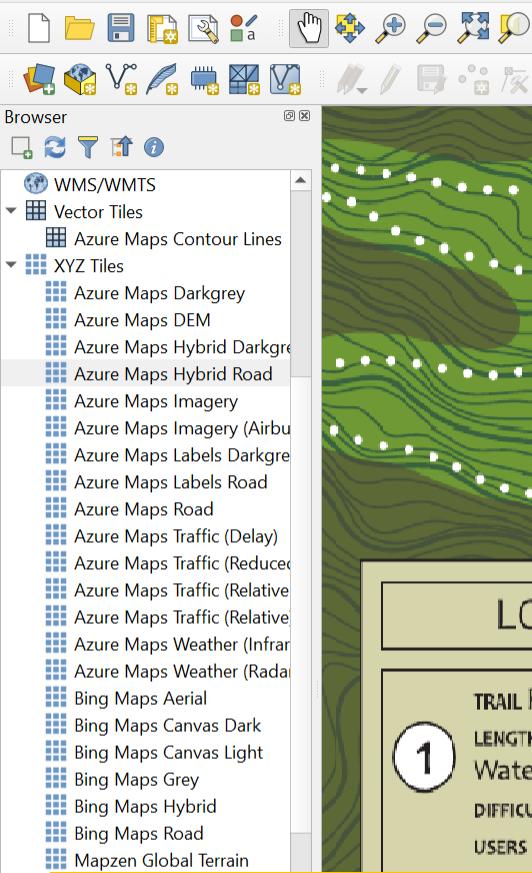
Help

1. In the dialog that opens click on the button for the box [Extent] and select the option [Calculate from Layer]. Select the newly added raster layer.

Processing Toolbox

Search...

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
 - Convert map to raster
 - Fill NoData cells
 - Generate XYZ tiles (Directory)
 - Generate XYZ tiles (MBTiles)
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL
- GRASS
- SAGA



Generate XYZ Tiles (Directory)

Parameters

Log

Extent

545,6011171.6725,6014312.9138 [EPSG:3857]

Minimum zoom

15

1

Maximum zoom

20

2

DPI

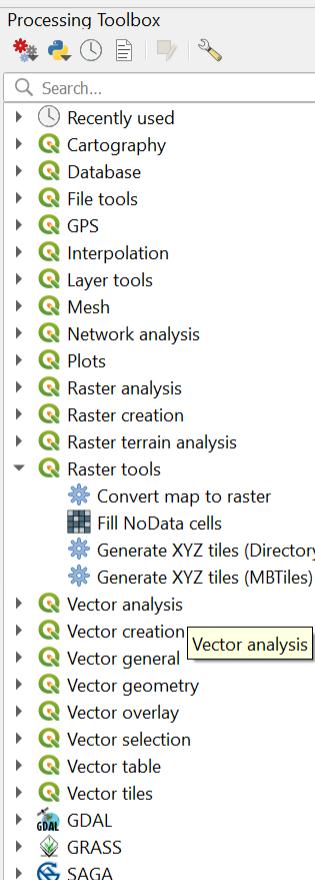
96

Background color [optional]

Generate XYZ tiles (Directory)

This algorithm generates raster XYZ tiles of map canvas content.

Tile images are saved as individual images in directory structure.



1. Set the [Minimum zoom] to 15
2. Set the [Maximum zoom] to 20
3. Scroll the Parameter panel further down.

Run

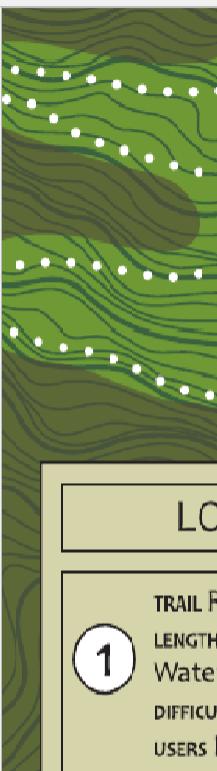
Close

Help



Browser

- WMS/WMTS
- Vector Tiles
 - Azure Maps Contour Lines
- XYZ Tiles
 - Azure Maps Darkgrey
 - Azure Maps DEM
 - Azure Maps Hybrid Darkgrey
 - Azure Maps Hybrid Road
 - Azure Maps Imagery
 - Azure Maps Imagery (Airbus)
 - Azure Maps Labels Darkgrey
 - Azure Maps Labels Road
 - Azure Maps Road
 - Azure Maps Traffic (Delay)
 - Azure Maps Traffic (Reduced)
 - Azure Maps Traffic (Relative)
 - Azure Maps Traffic (Relative)
 - Azure Maps Weather (Infrared)
 - Azure Maps Weather (Radar)
 - Bing Maps Aerial
 - Bing Maps Canvas Dark
 - Bing Maps Canvas Light
 - Bing Maps Grey
 - Bing Maps Hybrid
 - Bing Maps Road
 - Mapzen Global Terrain



Generate XYZ Tiles (Directory)

Parameters Log

4

Tile width

256

Tile height

256

Use inverted tile Y axis (TMS convention) [optional]

Output directory [optional]

\Documents\GeoData\Rattlesnake-Lake\Tiles

Output html (Leaflet) [optional]

[Save to temporary file]

Generate XYZ tiles (Directory)

This algorithm generates raster XYZ tiles of map canvas content.

Tile images are saved as individual images in directory structure.

1

Run

Close

Help

1. Set the [Output directory] for the generated tiles
2. Click [Run]

Processing Toolbox

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
 - Convert map to raster
 - Fill NoData cells
 - Generate XYZ tiles (Directory)
 - Generate XYZ tiles (MBTiles)
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL
- GRASS
- SAGA



elevation 950'

Coordinate -13554693,6013297 Scale 1:6678 Magnifier 100% Rotation 0.0° Render EPSG:3857

The QGIS interface shows a map canvas with green contour lines representing elevation. A legend on the right side provides information about a trail: LENGTH: 1, Water: 1, DIFFICULTY: 1, and USERS: 1. The legend also includes icons for location, trail, length, water, difficulty, and users.

Generate XYZ Tiles (Directory)

Log

```
9,6011171.672500000,6014312.913800000
[EPSG:3857]', 'METATILESIZE' : 4,
'OUTPUT_DIRECTORY' : 'C:\\\\Users\\\\jokebeck\\\\OneDrive - Microsoft\\\\Documents\\\\GeoData\\\\Rattlesnake-Lake\\\\Tiles', 'OUTPUT_HTML' :
'TEMPORARY_OUTPUT', 'QUALITY' : 75,
'TILE_FORMAT' : 0, 'TILE_HEIGHT' : 256,
'TILE_WIDTH' : 256, 'TMS_CONVENTION' :
False, 'ZOOM_MAX' : 20, 'ZOOM_MIN' : 15
}
```

Using 8 CPU Threads:

```
Generating tiles for zoom level: 15
Generating tiles for zoom level: 16
Generating tiles for zoom level: 17
Generating tiles for zoom level: 18
```

Generate XYZ tiles (Directory)

This algorithm generates raster XYZ tiles of map canvas content.

Tile images are saved as individual images in directory structure.

Close**Help**

1. Once the tiling is complete, click on [Close]

Processing Toolbox

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
 - Convert map to raster
 - Fill NoData cells
 - Generate XYZ tiles (Directory) **Vector analysis**
 - Generate XYZ tiles (MBTiles)
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL
- GRASS
- SAGA



EXPLORER

Search for resources



Collapse All

Refresh All

Quick Access

Local & Attached

Storage Accounts

Data Lake Storage Gen1 (Preview)

Azure Maps - SubLib - Loan05 (jokebeck@micr

Visual Studio Enterprise Subscription (jokebeck@micr

Storage Accounts

donkeyiotfuncstg

Blob Containers

\$logs

azure-webjobs-hosts

azure-webjobs-secrets

function-releases

intelogs

public

scm-releases

File Shares

Queues

Tables

Disks

Data Lake Storage Gen1 (Preview)

Upload



2

Download

Open

New Folder

Select All

Copy

Paste

Clone

Delete

Undelete

Manage History

Σ

Folder Statistics

Refresh

← → ↗ ↘

↑

Active blobs (default)

▼

public

...

| Name | Access Tier | Access Tier Last Modified | Last Modified | Blob Type | Content Type | Size | Status | Remaining Days | Deleted Time | Lease State | Disk Name | VM N |
|--|-------------|---------------------------|-------------------|------------|--------------------------|------------|--------|----------------|--------------|-------------|-----------|------|
| Woodland_Park_Zoo Folder | | | | | | | | | | | | |
| azure-maps-layer-legend.min.css | | | 6/10/2022 3:04 PM | Block Blob | text/css | 6.07 KiB | Active | | | | | |
| azure-maps-layer-legend.min.js | | | 6/10/2022 3:04 PM | Block Blob | text/javascript | 45.08 KiB | Active | | | | | |
| favicon.ico | | | 6/8/2022 2:47 PM | Block Blob | image/x-icon | 14.73 KiB | Active | | | | | |
| lochistory.json | | | 6/17/2022 6:30 PM | Block Blob | application/octet-stream | 486.06 KiB | Active | | | | | |
| Zoo_Map.png | | | 6/11/2022 3:06 PM | Block Blob | image/png | 2.10 MiB | Active | | | | | |

Now that you have your tiles you need to upload them to a location where the website can reach them. Azure Blob Storage is a good service for this purpose and you already created a public container with CORS policies. You can use the Azure Storage Explorer to upload entire directories.

1. Navigate to the container [public] you created earlier
2. Click [Upload]

Microsoft Azure Storage Explorer

File Edit View Help

EXPLORER

public

Upload Download

Quick Access

Local & Attached

Storage Accounts

Data Lake Storage Gen1 (Preview)

Azure Maps - SubLib - Loan05 (jokebeck@microsoft.com)

Azure Maps - SubLib - Loan05 (jokebeck@microsoft.com)

Visual Studio Enterprise Subscription (jokebeck@microsoft.com)

Storage Accounts

donkeyiotfuncstg

Blob Containers

\$logs

azure-webjobs-hosts

azure-webjobs-secrets

function-releases

iotclogs

lochistory.json

Zoo_Map.png

Woodland_Park

azure-maps-lay

favicon.ico

Rattlesnake_Lake

1

...

Selected folder:

Blob type:

Block Blob

Upload .vhdx files as page blobs (recommended)

Destination directory:

/

Upload

Cancel

2

Microsoft Azure Storage Explorer

Upload Folder

Select the folder you want to upload, the type of blob you want to upload as, and the destination directory.

Status Remaining Days Deleted Time Lease State Disk Name VM N

Active Active Active Active Active

1. Select the folder with the tiles you created in QGIS
2. Click [Upload]

File Edit View Help

EXPLORER

Search for resources

Collapse All Refresh All

Quick Access

Local & Attached

- Storage Accounts
 - Data Lake Storage Gen1 (Preview)
 - Azure Maps - SubLib - Loan05 (jokebeck@mic...
- Visual Studio Enterprise Subscription (jokebeck@mic...
- Storage Accounts
 - donkeyiofuncstg
 - Blob Containers
 - \$logs
 - azure-webjobs-hosts
 - azure-webjobs-secrets
 - function-releases
 - iotclogs
 - public
 - scm-releases
 - File Shares
 - Queues
 - Tables
 - Disks
- Data Lake Storage Gen1 (Preview)

public

Upload Download Open New Folder Select All Copy Paste Clone Delete Undelete Manage History Folder Statistics Refresh

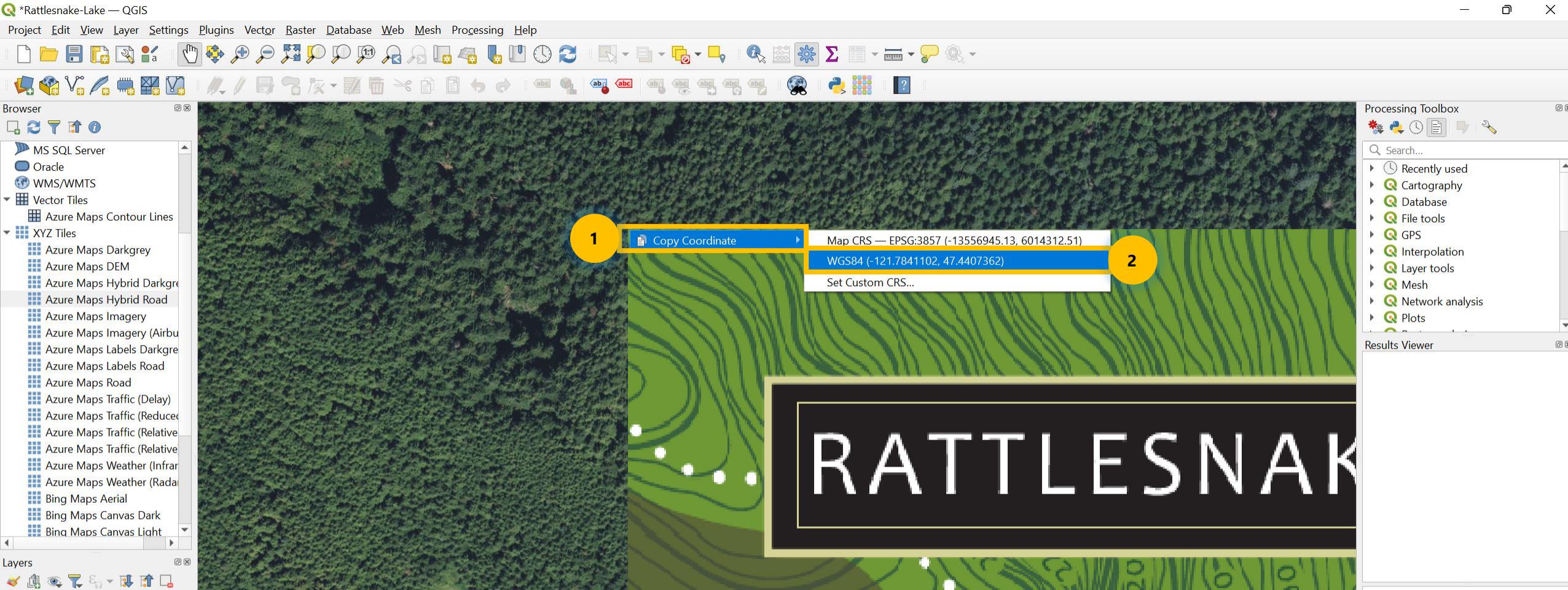
Active blobs (default) public

| Name | Access Tier | Access Tier Last Modified | Last Modified | Blob Type | Content Type | Size | Status | Remaining Days | Deleted Time | Lease State | Disk Name | VM |
|---------------------------------|-------------|---------------------------|-------------------|------------|--------------------------|------------|--------|----------------|--------------|-------------|-----------|----|
| Rattlesnake_Lake | | | | | Folder | | | | | | | |
| Woodland_Park_Zoo | | | | | Folder | | | | | | | |
| azure-maps-layer-legend.min.css | | | 6/10/2022 3:04 PM | Block Blob | text/css | 6.07 KiB | Active | | | | | |
| azure-maps-layer-legend.min.js | | | 6/10/2022 3:04 PM | Block Blob | text/javascript | 45.08 KiB | Active | | | | | |
| favicon.ico | | | 6/8/2022 2:47 PM | Block Blob | image/x-icon | 14.73 KiB | Active | | | | | |
| lochhistory.json | | | 6/17/2022 6:30 PM | Block Blob | application/octet-stream | 486.06 KiB | Active | | | | | |
| Zoo_Map.png | | | 6/11/2022 3:06 PM | Block Blob | image/png | 2.10 MiB | Active | | | | | |

Once the upload is complete you can close the Azure Storage Explorer.

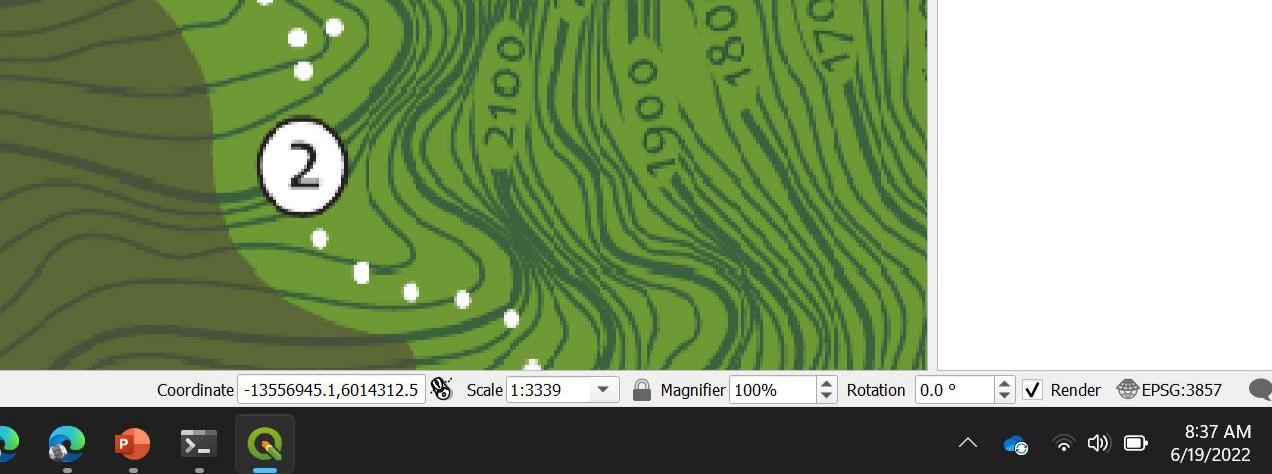
Rattlesnake_Lake\Rattlesnake_Lake' to 'public/' complete: 6474 items transferred (used SAS, discovery completed)

[Copy AzCopy Command to Clipboard](#)



Tile Layers can be added globally but if you do, the map control will request tiles even for areas where you don't have tiles. Do avoid calls that will inevitably fail you can define the boundary of the tile layer. To get this boundary:

1. Right click on the top-left and bottom-right corners of the raster layer and pick [Copy Coordinate] from the context menu.
2. Click on [WGS84]



File Edit Selection View Go Run Terminal Help index.html - AzM_Web_PubSub_Demo - Visual Studio Code

EXPLORER ... index.html X local.settings.json

AZM_WEB_PUBSUB_DEMO

- > .vscode
- > bin
- > index
- > negotiate
- > node_modules
- > notification
- > obj
- processdata
 - { function.json
 - index.js
 - readme.md
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package-lock.json
- package.json

1

```
// Add another tile layer
map.layers.add(new atlas.layer.TileLayer([
  tileUrl: 'https://azuredemos.blob.core.windows.net/public/Rattlesnake_Lake/{z}/{x}/{y}.png',
  opacity: 1,
  tileSize: 256,
  minSourceZoom: 15,
  maxSourceZoom: 20,
  bound: [-121.784125470, 47.421649710, -121.764394159, 47.440738654], //West, South, East, North
  visible: false
]), 'Rattlesnake Lake (Tiles)', null);

// Connect to Azure Web PubSub
(async function () {
  let res = await fetch(`${window.location.origin}/api/negotiate`);
  let url = await res.json();
  let ws = new WebSocket(url.url);
  ws.onopen = () => console.log('connected');

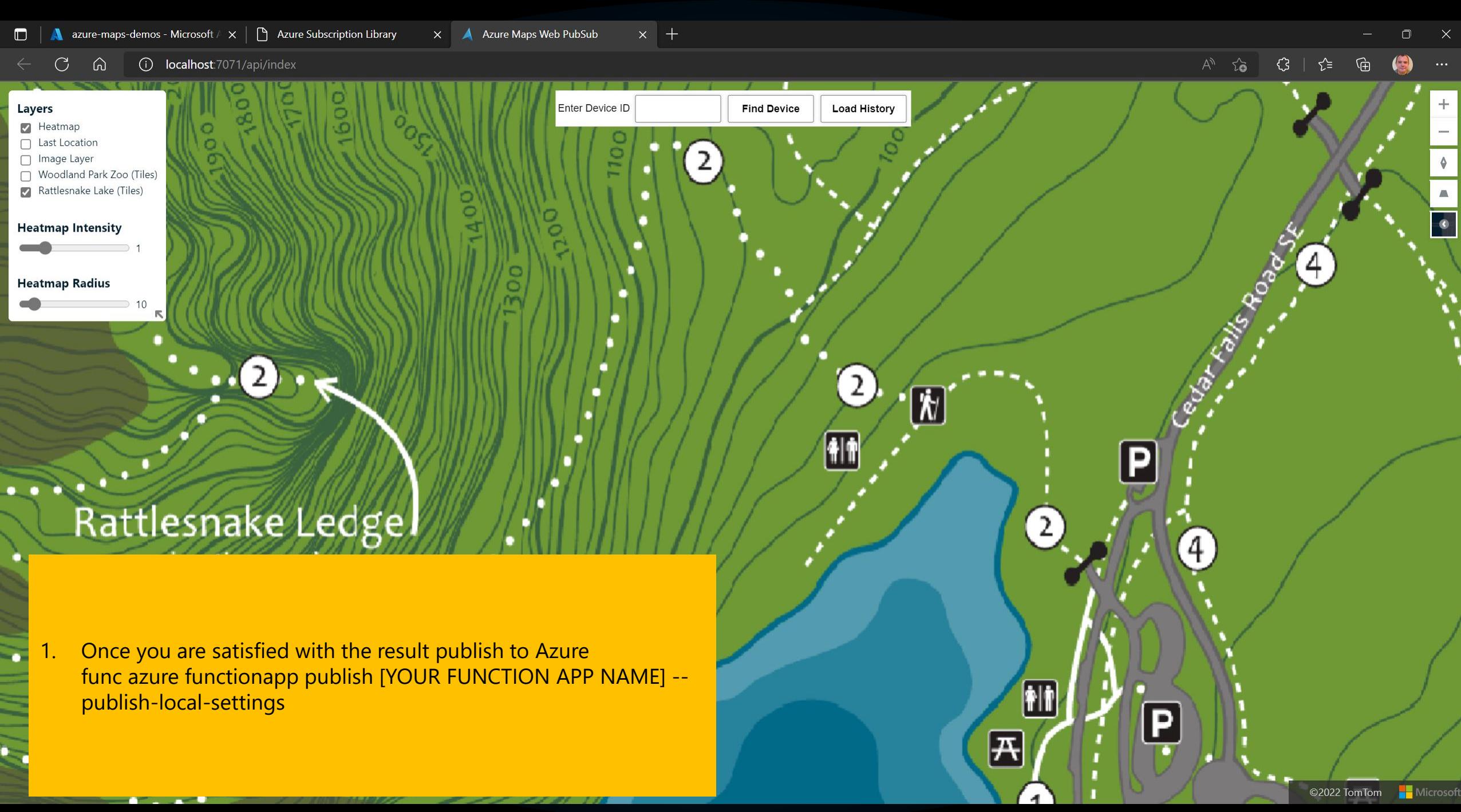
  ws.onmessage = event => {
    var msg = JSON.parse(event.data);
    console.log("Telemetry update for Device ID: " + msg.DeviceID + ", Lat: " + msg.Lat + ", Lon: " + msg.Lon);
    dsHeatmap.add(new atlas.data.Point([msg.Lon, msg.Lat]));

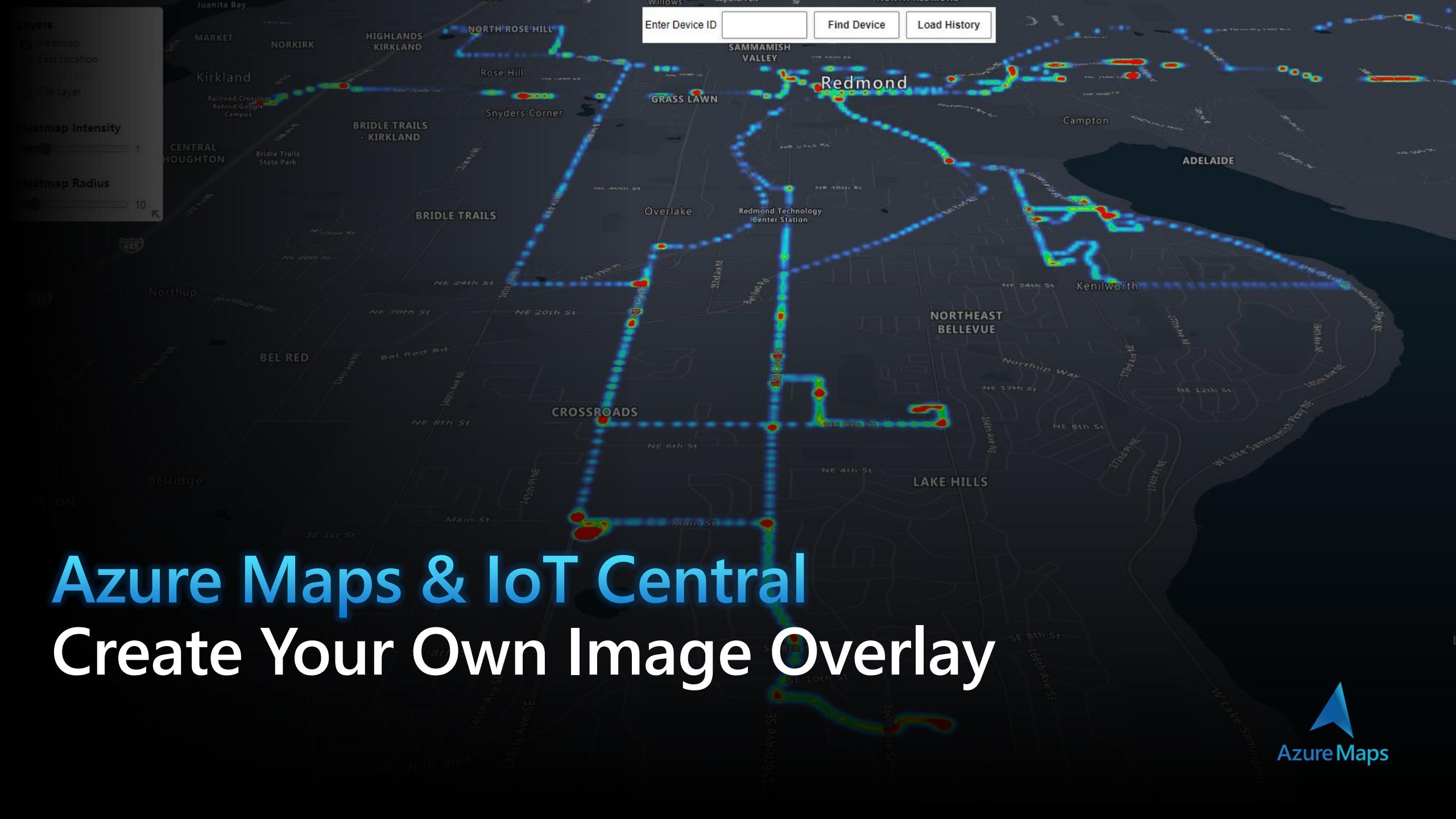
    try{
      dsLastLoc.getShapeById(msg.DeviceID).setCoordinates([msg.Lon, msg.Lat]);
    }
    catch(err){
      dsLastLoc.add( new atlas.data.Feature(new atlas.data.Point([msg.Lon, msg.Lat]), {
        color: 'red',
        colorLon: 'redLon: ' + msg.Lon
      }));
    }
  }
})()
```

node + ×

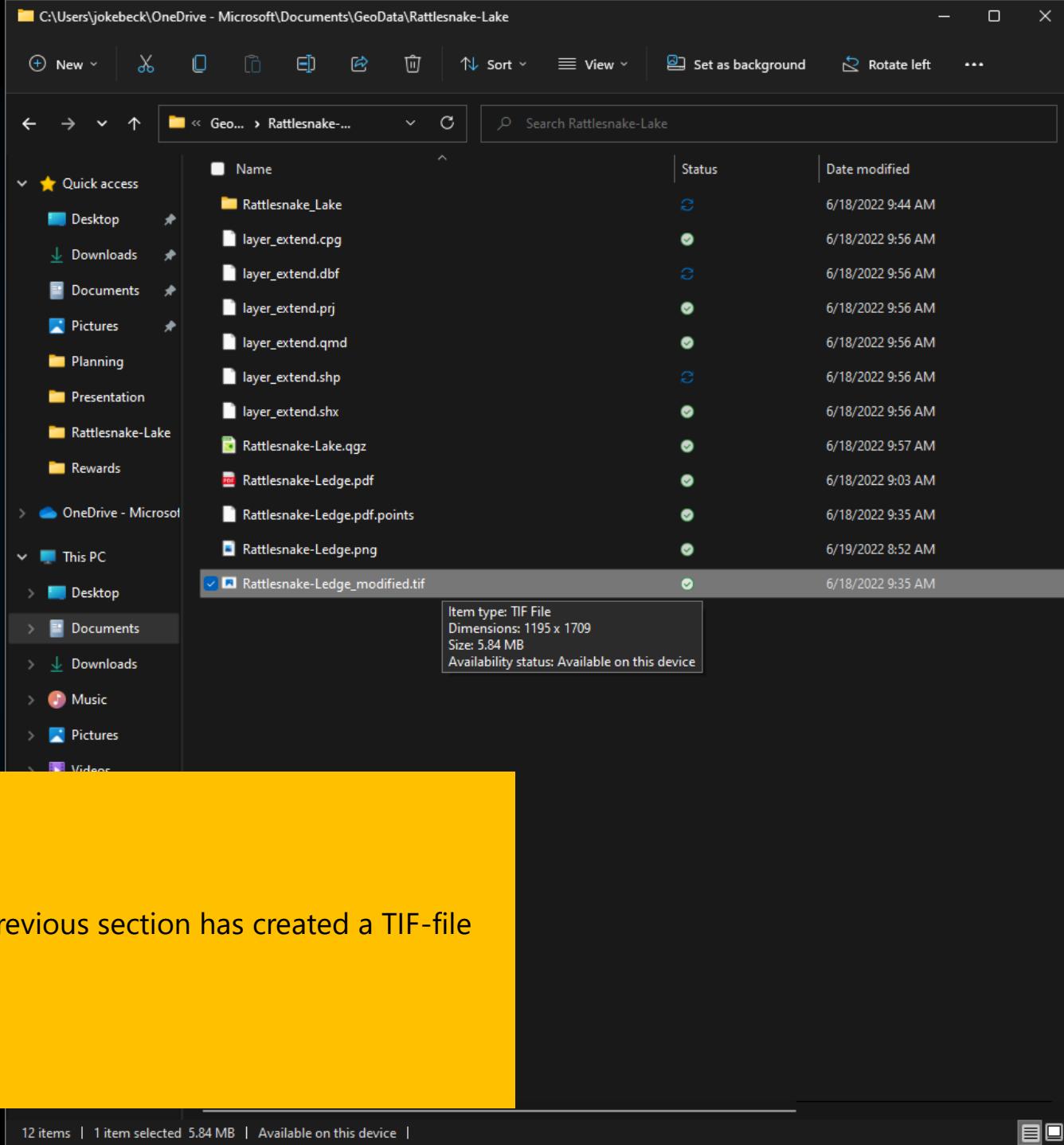
Ln 246, Col 104 Spaces: 4 UTF-8 CRLF HTML Go Live

1. Update the tileURL and bounds in the index.html of your Azure Function project
2. Run the function locally to test func start

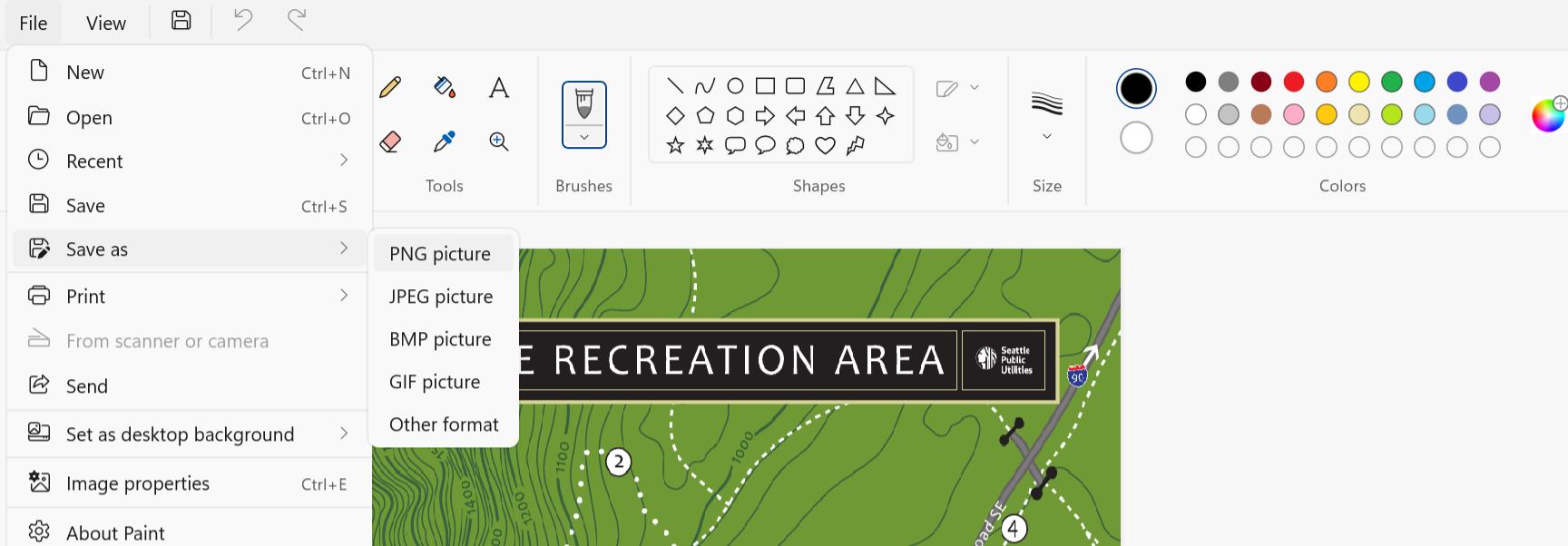




Azure Maps



1. The georeferencing in the previous section has created a TIF-file from the PDF document.



1. Open the TIF file in Paint and save as PNG.

File Edit View Help

EXPLORER

Search for resources

Collapse All Refresh All

Quick Access

Local & Attached

Azure Maps - SubLib - Loan05 (jokebeck@microsoft.com)

Storage Accounts

azuremapsdemos

- Blob Containers
- \$logs
- azure-webjobs-hosts
- azure-webjobs-secrets
- function-releases
- iotclogs
- public
- scm-releases

File Shares

Queues

Tables

westeuropeblobauditstore

westusauditstoreivfa6ws

Disks

Data Lake Storage Gen1 (Preview)

Visual Studio Enterprise Subscription (jokebeck@microsoft.com)

public

Upload Download Open New Folder Select All Copy Paste Clone Delete Undelete Manage History Folder Statistics Refresh

Active blobs (default) public

| Name | Access Tier | Access Tier Last Modified | Last Modified | Blob Type | Content Type | Size | Status | Remaining Days | Deleted Time | Lease State | Disk Name | VM |
|---------------------------------|-------------|---------------------------|-------------------|------------|--------------------------|------------|--------|----------------|--------------|-------------|-----------|----|
| Rattlesnake_Lake | | | | | Folder | | | | | | | |
| Woodland_Park_Zoo | | | | | Folder | | | | | | | |
| azure-maps-layer-legend.min.css | | | 6/15/2022 5:20 PM | Block Blob | text/css | 6.07 KiB | Active | | | | | |
| azure-maps-layer-legend.min.js | | | 6/15/2022 5:20 PM | Block Blob | application/javascript | 45.08 KiB | Active | | | | | |
| favicon.ico | | | 6/15/2022 5:20 PM | Block Blob | image/x-icon | 14.73 KiB | Active | | | | | |
| lochhistory.json | | | 6/18/2022 6:30 PM | Block Blob | application/octet-stream | 57.02 KiB | Active | | | | | |
| Rattlesnake-Ledge.png | | | 6/19/2022 8:55 AM | Block Blob | image/png | 628.44 KiB | Active | | | | | |
| Zoo_Map.png | | | 6/15/2022 5:20 PM | Block Blob | image/png | 2.10 MiB | Active | | | | | |

1. Upload the image to the public blob container in your Azure Storage account.

Rattlesnake-Lake\Rattlesnake-Ledge.png' to 'public/' complete: 1 item transferred (used SAS, discovery completed)

[Copy AzCopy Command to Clipboard](#)

File Edit Selection View Go Run Terminal Help index.html - AzM_Web_PubSub_Demo - Visual Studio Code

EXPLORER ... index.html local.settings.json

AZM_WEB_PUBSUB_DEMO

- > vscode
- > bin
- > index
- > negotiate
- > node_modules
- > notification
- > obj
- processdata
 - function.json
 - index.js
 - readme.md
- .gitignore
- extensions.csproj
- host.json
- index.html
- local.settings.json
- package-lock.json
- package.json

1

```
// Add another image layer
map.layers.add(new atlas.layer.ImageLayer({
  url: 'https://azuredemos.blob.core.windows.net/public/Rattlesnake-Ledge.png',
  coordinates: [
    [-121.784125470, 47.440738654], //Top Left Corner
    [-121.764394159, 47.440738654], //Top Right Corner
    [-121.764394159, 47.421649710], //Bottom Right Corner
    [-121.784125470, 47.421649710] //Bottom Left Corner
  ],
  minZoom: 15,
  maxZoom: 20,
  visible: false
}), 'Rattlesnake Lake (Image)');

// Add a tile layer
map.layers.add(new atlas.layer.TileLayer({
  tileUrl: 'https://azuredemos.blob.core.windows.net/public/Woodland_Park_Zoo/{z}/{x}/{y}.png',
  opacity: 1,
  tileSize: 256,
  minSourceZoom: 15,
  maxSourceZoom: 20,
  bound: [-122.354820874, 47.664543535, -122.347396551, 47.672017926], //West, South, East, North
  visible: false
}, 'Woodland Park Zoo (Tiles)'), null);

// Add another tile layer
map.layers.add(new atlas.layer.TileLayer({
  tileUrl: 'https://azuredemos.blob.core.windows.net/public/Rattlesnake_Lake/{z}/{x}/{y}.png',
  opacity: 1,
  tileSize: 256,
  minSourceZoom: 15,
  maxSourceZoom: 20,
  bound: [-121.784125470, 47.421649710, -121.764394159, 47.440738654], //West, South, East, North
  visible: false
}), 'Rattlesnake Lake (Tiles)'), null);
```

node + □ ×

Ln 235, Col 104 Spaces: 4 UTF-8 CRLF HTML Go Live

1. Update the url and bounds in the index.html of your Azure Function project. (see the previous section on how to get the coordinates of the bounding box in QGIS)

2. Run the function locally to test
func start

Azure Maps Web PubSub x +

localhost:7071/api/index

Layers

- Heatmap
- Last Location
- Woodland Park Zoo (Image)
- Rattlesnake Lake (Image)
- Woodland Park Zoo (Tiles)
- Rattlesnake Lake (Tiles)

Heatmap Intensity

Heatmap Radius

Enter Device ID Find Device Load History

Rattlesnake Ledge elevation 2079'

LOCAL TRAILS

TRAIL RATTLESNAKE LAKE LENGTH ¾ mile to Cedar River Watershed Education Center DIFFICULTY Very Easy USERS Foot, Bike, ADA Accessible

1

2

3

4

Cedar Falls Road SE

NFD Road 50

State Park elevation 950'

1. LENGTH 8 miles to North Bend

©2022 TomTom Microsoft



Azure Maps

Dashboard | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Edit Copy Delete

Dashboard settings

Connect

Devices

Device groups

Device templates

Analyze

Data explorer

Dashboards

Manage

Jobs

Extend

1. Edit main dashboard and add an external content tile...

Dashboard

Go to dashboard catalog

Device templates

Get started by adding your first device.

Quick start demo

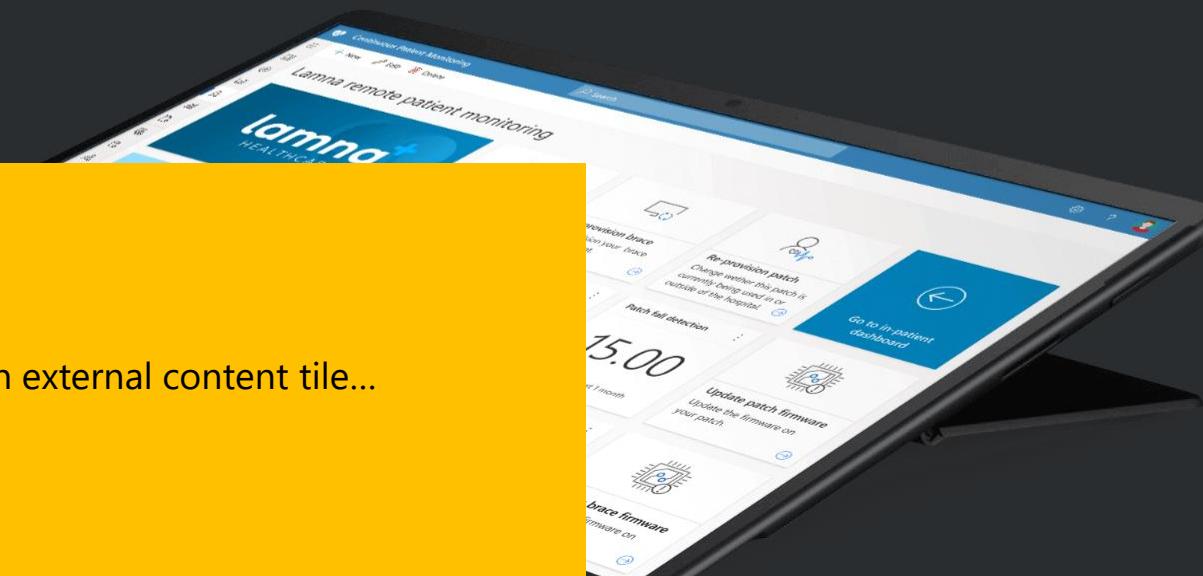
Learn how to use Azure IoT Central in minutes.

Tutorials

Step-by-step articles teach you how to create apps and devices.

Documentation

Comprehensive help articles and links to more support.



Dashboard | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Save Cancel

Add a tile

Start with a visual Start with devices

Choose the type of visual you want to show on your tile, and then click Add tile (or just drag and drop it on the canvas). Click the Settings icon on your new tile to add content or device data.

- Key Performance Indicator (KPI)
Set up telemetry for devices over a set time range
- Last known value (LKV)
Show the last value reported for one or more devices
- Line chart
Track aggregate telemetry values over time as a dynamic line
- Bar chart
Show aggregate telemetry values over time as vertical bars
- Pie chart
Show aggregate telemetry values over time as a circular chart
- Heat map
Use color to show variations in device data
- Event history

Dashboard

Device templates

Quick start demo

Tutorials

Documentation

Lamma remote patient monitoring

Lamma healthcare

Smart patch patch

Re-provision patch

Re-provision brace

Re-provision patch

Re-provision brace

Go to inpatient dashboard

64.00

15.00

Average patch

Average brace

Patch battery level

Brace information

Device name

Device status

Connectivity

Needs re-provision

Needs a patch update

Needs a brace update

Update patch firmware

Update brace firmware

Dashboard | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Add a tile

Save Cancel

Connect

- Devices
- Device groups
- Device templates

Analyze

- Data explorer

Dashboards

Manage

- Jobs

Extend

- External content
- Number of devices (Count)
- Data explorer query

Security

- Permissions

Settings

- Application
- Customization

Add tile

Dashboard

Dashboard | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Save Cancel

Add a tile

Map (telemetry)

Use telemetry to map a device's geographical location (and location history)

Image (static)

Display an uploaded image file, and optionally add a URL

Label

Display custom text, descriptions, or labels

Markdown

Apply text styling, or add an image and a URL using markdown

External content

Microsoft Bing Work jokesbeds@microsoft.com 200 Microsoft Rewards

Angry bird, doting dad

Tests positive

War morale a concern

Animals in U-Haul

Add tile

Dashboard | Azure Maps Demos X +

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Configure external cont...

Add a tile

Save Cancel

Connect

- Devices
- Device groups
- Device templates

Analyze

- Data explorer

Dashboards

Manage

- Jobs

Extend

- External content

Rules

Data export

Security

Permissions

Settings

- Application
- Customization

Add tile

Map (telemetry)

Use telemetry to map a device's geographical location (and location history)

Image (static)

Display an uploaded image file, and optionally add a URL

Label

Display custom text, descriptions, or labels

Markdown

Apply text styling, or add an image and a URL using markdown

External content

LATEST FROM MICROSOFT

TOP STORIES

WEATHER

Configure external content

Title

Azure Maps Web PubSub Demo

Source

https://azure-maps-demos.azurewebsites....

Update Cancel

Dashboard | Azure Maps Demos

https://azure-maps-demos.azureiotcentral.com/dashboards/dtmi%3Akkfwaw2xi%3Ap7pyt5x3o

Azure Maps Demos

Search for devices

Add a tile

Save Cancel

Connect

- Devices
- Device groups
- Device templates

Analyze

- Data explorer

Dashboards

Manage

- Jobs

Extend

- External content

Rules

Data export

Security

Permissions

Settings

Application

Customization

Add tile

Map (telemetry)

Use telemetry to map a device's geographical location (and location history)

Image (static)

Display an uploaded image file, and optionally add a URL

Label

Display custom text, descriptions, or labels

Markdown

Apply text styling, or add an image and a URL using markdown

Number of devices (Count)

Total number of devices in a device group

Data explorer query

Add a tile linked to a saved Data explorer query

Dashboard

Azure Maps Web PubSub Demo

Enter Device ID

Find Device

Load History

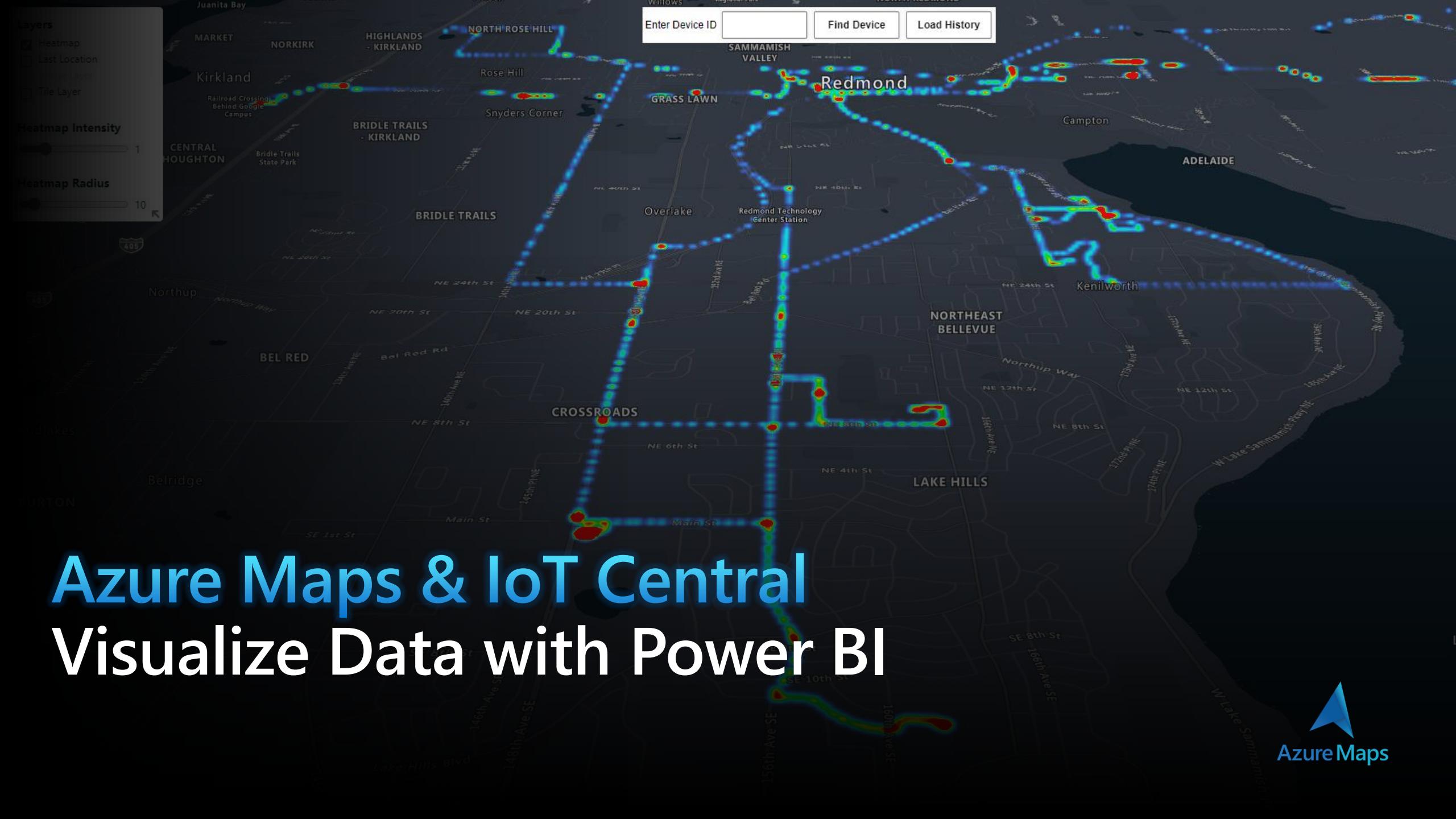
Layers

- Heatmap
- Last Location
- Woodland Park Zoo (Image)
- Rattlesnake Lake (Image)
- Woodland Park Zoo (Tiles)
- Rattlesnake Lake (Tiles)

Heatmap Intensity

Heatmap Radius

©2022 TomTom Microsoft

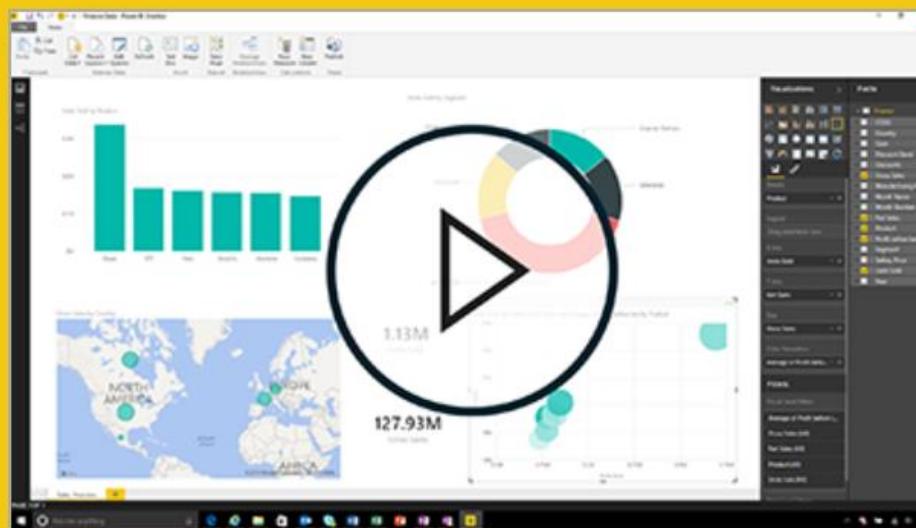


Power BI Desktop

 Get data

 Recent sources

 Open other reports



Getting started with Power BI Desktop



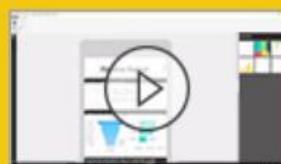
Building reports



Query view concepts



Uploading your reports



Create a Phone report

[VIEW ALL VIDEOS](#)

✓ Show this screen on startup

Johannes Kebeck



WHAT'S NEW

Take a look at what's new and improved in Power BI in this month's update.

FORUMS

Visit the Power BI Forum to ask questions or interact with other users in the Power BI community.

POWER BI BLOG

Keep up to date with the latest news, resources, and updates from the Power BI team.

TUTORIALS

Ready to learn more about Power BI?

- Get started with Power BI Desktop
- Download a sample
- Watch our training videos
- See what others have built
- All guided learning



Get Data

[All](#)[File](#)[Database](#)[Power Platform](#)[Azure](#)[Online Services](#)[Other](#)

Azure

Azure SQL database

Azure Synapse Analytics SQL

Azure Analysis Services database

Azure Database for PostgreSQL

Azure Blob Storage

Azure Blob Storage

Azure Cosmos DB

Azure Data Explorer (Kusto)

Azure Data Lake Storage Gen2

Azure Data Lake Storage Gen1

Azure HDInsight (HDFS)

Azure HDInsight Spark

HDInsight Interactive Query

Azure Cost Management

Azure Databricks

Azure Synapse Analytics workspace (Beta)

[Certified Connectors](#)[Template Apps](#)[Connect](#)[Cancel](#)



Azure Blob Storage

Account name or URL

A text input field containing the value "azuremapsdemos".A yellow rectangular button labeled "OK".A white rectangular button labeled "Cancel".

Navigator

Display Options ▾

- ◀ azuremapsdemos [6]
 - azure-webjobs-hosts
 - azure-webjobs-secrets
 - function-releases
 - iotclogs
 - public
 - scm-releases

iotclogs



| Content | Name | Extension |
|---------|--|-----------|
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/33/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/34/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/35/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/36/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/37/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/38/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/39/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/40/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/41/dgdrztdy | |
| Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/42/dgdrztdy | |



Load

Transform Data

Cancel

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply New Recent Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Properties Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Binary Use First Row as Headers Merge Queries Append Queries Combine Files Text Analytics Vision Azure Machine Learning Close New Query Data Sources Parameters Query Manage Manage Columns Reduce Rows Sort Transform Combine AI Insights

Queries [1]

= Source{[Name="iotclogs"]}[Data]

| | Content | Name | Extension | Date accessed | Date modified | Date created |
|----|---------|--|-----------|---------------|-----------------------|--------------|
| 1 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | | null | 6/15/2022 11:32:50 PM | |
| 2 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | | null | 6/15/2022 11:33:50 PM | |
| 3 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/33/dgdrz... | | null | 6/15/2022 11:34:50 PM | |
| 4 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/34/dgdrz... | | null | 6/15/2022 11:35:50 PM | |
| 5 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/35/dgdrz... | | null | 6/15/2022 11:36:50 PM | |
| 6 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/36/dgdrz... | | null | 6/15/2022 11:37:50 PM | |
| 7 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/37/dgdrz... | | null | 6/15/2022 11:38:50 PM | |
| 8 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/38/dgdrz... | | null | 6/15/2022 11:39:50 PM | |
| 9 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/39/dgdrz... | | null | 6/15/2022 11:40:50 PM | |
| 10 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/40/dgdrz... | | null | 6/15/2022 11:41:50 PM | |
| 11 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/41/dgdrz... | | null | 6/15/2022 11:42:50 PM | |
| 12 | Binary | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/42/dgdrz... | | null | 6/15/2022 11:43:50 PM | |

Query Settings

PROPERTIES

Name: iotclogs

All Properties

APPLIED STEPS

Source

Navigation

8 COLUMNS, 12 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 9:31 AM

Combine Files

Specify the settings for each file. [Learn more](#)

Sample File:

First file

File Origin

1252: Western European (Windows)

Delimiter

Comma

Data Type Detection

Based on first 200 rows



| Column1 | Column2 | Column3 | Column4 | Column5 |
|----------------------------|--|--------------------------------------|-----------------|---------------------|
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:26.023Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.670976 | lon: -122.0172118}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:27.179Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6710336 | lon: -122.0171093}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:28.429Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6709979 | lon: -122.0170445}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:29.773Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.671201 | lon: -122.0169701}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:30.866Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713873 | lon: -122.0170626}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:31.976Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713981 | lon: -122.0174528}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:33.070Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.671378 | lon: -122.0180046}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:34.163Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713759 | lon: -122.0184906}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:35.273Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713955 | lon: -122.0189788}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:36.366Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713766 | lon: -122.0196041}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:37.460Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713593 | lon: -122.020322}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:38.570Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713526 | lon: -122.0209113}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:39.679Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713528 | lon: -122.021431}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:40.789Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6713579 | lon: -122.0217345}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:41.929Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6712123 | lon: -122.0219019}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:43.211Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6707098 | lon: -122.021965}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:44.336Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6700076 | lon: -122.0220866}} |
| {"deviceId": "DonkeyPhone" | enqueuedTime: "2022-06-15T23:31:45.429Z" | telemetry: {"geolocation": {"alt": 0 | lat: 47.6694324 | lon: -122.0221806}} |

Skip files with errors

OK

Cancel

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply New Recent Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Properties Choose Columns Remove Columns Sort Data Type: Text Data Type: Text Use First Row as Headers Split Column Group By Merge Queries Text Analytics Close New Query Data Sources Parameters Query Manage Manage Columns Keep Rows Remove Rows Reduce Rows Replace Values Append Queries Vision Combine Files Azure Machine Learning Combine AI Insights

Queries [5]

- Transform File from i...
- Helper Queries [3]
 - Parameter1 (Sampl...)
 - Sample File
 - Transform File
- Transform Sample File
- Other Queries [1]
 - iotclogs

Query Settings

PROPERTIES

Name: iotclogs
All Properties

APPLIED STEPS

- Source
- Navigation
- Filtered Hidden Files1
- Invoke Custom Function1
- Renamed Columns1
- Removed Other Columns1
- Expanded Table Column1
- Changed Type

| | Source.Name | Column1 | Column2 | Column3 | Column4 |
|----|--|-----------------------------|--|--|-----------------|
| 1 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:26.023Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.670976 |
| 2 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:27.179Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6710336 |
| 3 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:28.429Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6709979 |
| 4 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:29.773Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.671201 |
| 5 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:30.866Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713873 |
| 6 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:31.976Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713981 |
| 7 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:33.070Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.671378 |
| 8 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:34.163Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713759 |
| 9 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:35.273Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713955 |
| 10 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:36.366Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713766 |
| 11 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:37.460Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713593 |
| 12 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:38.570Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713526 |
| 13 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:39.679Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713528 |
| 14 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:40.789Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6713579 |
| 15 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:41.929Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6712123 |
| 16 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:43.211Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6707098 |
| 17 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:44.336Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6700076 |
| 18 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:45.429Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6694324 |
| 19 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:46.539Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6688695 |
| 20 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/31/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:47.632Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6682945 |
| 21 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:48.742Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6677323 |
| 22 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:49.851Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6670378 |
| 23 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:50.961Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6666301 |
| 24 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:52.054Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6664631 |
| 25 | ed3027c7-5a10-498d-a6f9-e612e80e542b/0/2022/06/15/23/32/dgdrz... | {"deviceId": "DonkeyPhone"} | enqueuedTime: "2022-06-15T23:31:53.164Z" | telemetry: {"geolocation": {"alt": 0}} | lat: 47.6662534 |

6 COLUMNS, 199+ ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED AT 9:33 AM

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Close & Apply New Recent Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Properties Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Decimal Number Use First Row as Headers Merge Queries Append Queries Combine Text Analytics Vision Azure Machine Learning Close New Query Data Sources Parameters Query Manage Manage Columns Reduce Rows Sort Replace Values Combine AI Insights

Queries [5]

- Transform File from i...
- Helper Queries [3]
 - Parameter1 (Sampl...
 - Sample File
 - Transform File
- Transform Sample File
- Other Queries [1]
 - iotclogs

= Table.RenameColumns(#"Removed Columns3",{{"Column5.2.1", "Lon"}})

| | 1.2 Lat | 1.2 Lon |
|----|------------|--------------|
| 1 | 47.670976 | -122.0172118 |
| 2 | 47.6710336 | -122.0171093 |
| 3 | 47.6709979 | -122.0170445 |
| 4 | 47.671201 | -122.0169701 |
| 5 | 47.6713873 | -122.0170626 |
| 6 | 47.6713981 | -122.0174528 |
| 7 | 47.671378 | -122.0180046 |
| 8 | 47.6713759 | -122.0184906 |
| 9 | 47.6713955 | -122.0189788 |
| 10 | 47.6713766 | -122.0196041 |
| 11 | 47.6713593 | -122.020322 |
| 12 | 47.6713526 | -122.0209113 |
| 13 | 47.6713528 | -122.021431 |
| 14 | 47.6713579 | -122.0217345 |
| 15 | 47.6712123 | -122.0219019 |
| 16 | 47.6707098 | -122.021965 |
| 17 | 47.6700076 | -122.0220866 |
| 18 | 47.6694324 | -122.0221806 |
| 19 | 47.6688695 | -122.0222858 |
| 20 | 47.6682945 | -122.0224111 |
| 21 | 47.6677323 | -122.0225031 |
| 22 | 47.6670378 | -122.0223671 |
| 23 | 47.6666301 | -122.0222625 |
| 24 | 47.6664631 | -122.0223145 |
| 25 | 47.6662534 | -122.0228578 |
| 26 | 47.6660408 | -122.0225450 |

2 COLUMNS, 568 ROWS Column profiling based on top 1000 rows

Query Settings

PROPERTIES

Name: iotclogs

All Properties

APPLIED STEPS

- Source
- Navigation
- Filtered Hidden Files1
- Invoke Custom Function1
- Renamed Columns1
- Removed Other Columns1
- Expanded Table Column1
- Changed Type
- Removed Columns
- Split Column by Delimiter
- Changed Type1
- Removed Columns1
- Renamed Columns
- Split Column by Delimiter1
- Changed Type2
- Removed Columns2
- Split Column by Delimiter2
- Changed Type3
- Removed Columns3
- Renamed Columns2

Untitled - Power BI Desktop

Johannes Kebeck

File Home Insert Modeling View Help

Cut Copy Format painter

Paste

Clipboard

Get data workbook hub Data SQL Server Enter data Recent sources Transform Refresh data New visual Text box More visuals New measure Quick measure Sensitivity Publish

Queries

Insert Calculations Sensitivity Share

Visualizations Build visual

Filters

Fields

Search

iotlogs

Lat Lon

Build visual

Values

Add data fields here

Drill through

Cross-report Off

Keep all filters On

Add drill-through fields here

Build visuals with your data

Select or drag fields from the Fields pane onto the report canvas.

Page 1 +

95%

Page 1 of 1



New

Open report

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Save as

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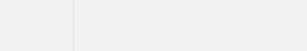
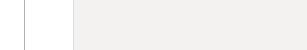
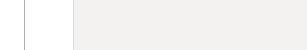
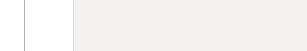
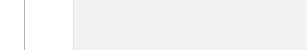
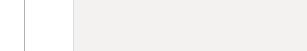
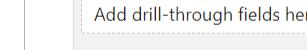
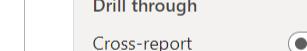
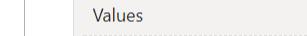
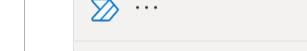
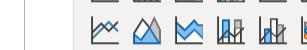
You haven't opened any reports recently. Select Browse to open a report from your files.

Quick
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▼Publish
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Report canvas.

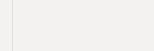
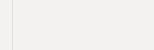
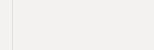
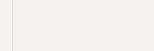
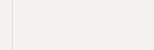
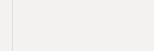
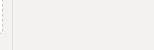
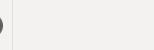
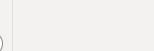
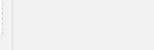
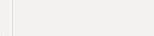
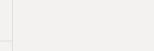
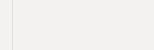
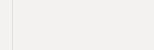
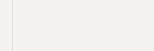
Visualizations

Build visual



Fields

Build visual





New

Open report

Save

Save as

Get data

Import

Export

Publish

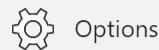
Options and settings

Get started

About

Sign out

Options and settings



Options



Data source settings

Quick
measureSensitivity
▼

Publish

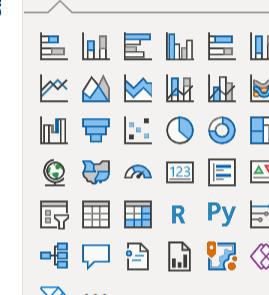
Share

Report canvas.

Filters

Visualizations

Build visual



Values

Add data fields here

Drill through

Cross-report



Off

Keep all filters



On

Add drill-through fields here

Fields

Search

iotlogs

 ∑ Lat ∑ Lon



Options

GLOBAL

- Data Load
- Power Query Editor
- DirectQuery
- R scripting
- Python scripting

Security

Privacy

Regional Settings

Updates

Usage Data

Diagnostics

Preview features

Auto recovery

Report settings

CURRENT FILE

- Data Load
- Regional Settings
- Privacy
- Auto recovery

Preview features

The following features are available for you to try in this release. Preview features might change or be removed in future releases.

- Shape map visual [Learn more](#)
- Spanish language support for Q&A [Learn more](#)
- Q&A for live connected Analysis Services databases [Learn more](#)
- Azure map visual [Learn more](#)
- DirectQuery for PBI datasets and AS [Learn more](#) | [Share feedback](#)
- Modern visual tooltips [Learn more](#) | [Share feedback](#)
- Power BI Desktop infrastructure update [Learn more](#)
- Web page connector infrastructure update [Learn more](#)
- Modify visuals settings for mobile layout [Learn more](#)
- Sparklines [Learn more](#)
- Scorecard visual [Learn more](#)
- Error bars [Learn more](#)
- Field parameters [Learn more](#)

OK

Cancel



Feature requires a restart

You have enabled one or more Preview features that require restarting Microsoft Power BI Desktop. These changes will take effect after you restart the application.

OK



File Home Insert Modeling View Help

Paste Cut
Get data
Clipboard

Excel Data SQL Server Enter data Recent sources
Clipboard

Transform Refresh data
New visual Text box More visuals
Insert Calculations Sensitivity
Sensitivity Share

Queries

Build visual

Filters

Visualizations

Fields

iotlogs

Lat Lon

Build visual

Values

Drill through

Cross-report Off

Keep all filters On

Add drill-through fields here

Filters on this page

Add data fields here

Filters on all pages

Add data fields here

Page 1

General

Page 1 of 1

86%

IoT-Central-Demo - Power BI Desktop

Johannes Kebeck

File Home Insert Modeling View Help Format Data / Drill

Cut Copy Format painter Paste Clipboard

Get data workbook hub Data SQL Server Enter data Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert Calculations Sensitivity Publish Share

Lat and Lon

Redmond

Feriton

Snyders Corner

Central Houghton

Bridle Trails

Overlake

Ashwood

Northup

Bel Red

VNT LLEVU

Midlakes

Bellevue

Rose Hill

Campton

Adelaide

Kenilworth

Sahalee

Union Novelty Hill

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Filters

Search

Lat is (All)

Lon is (All)

Add data fields here

Filters on this page

Add data fields here

Filters on all pages

Add data fields here

Build visual

Remove field

Rename for this visual

Move to

✓ Don't summarize

Sum

Average

Minimum

Maximum

Count (Distinct)

Count

Standard deviation

Variance

Median

New quick measure

Show items with no data

Latitude

Longitude

Legend

Bubble size

Tooltips

Drill through

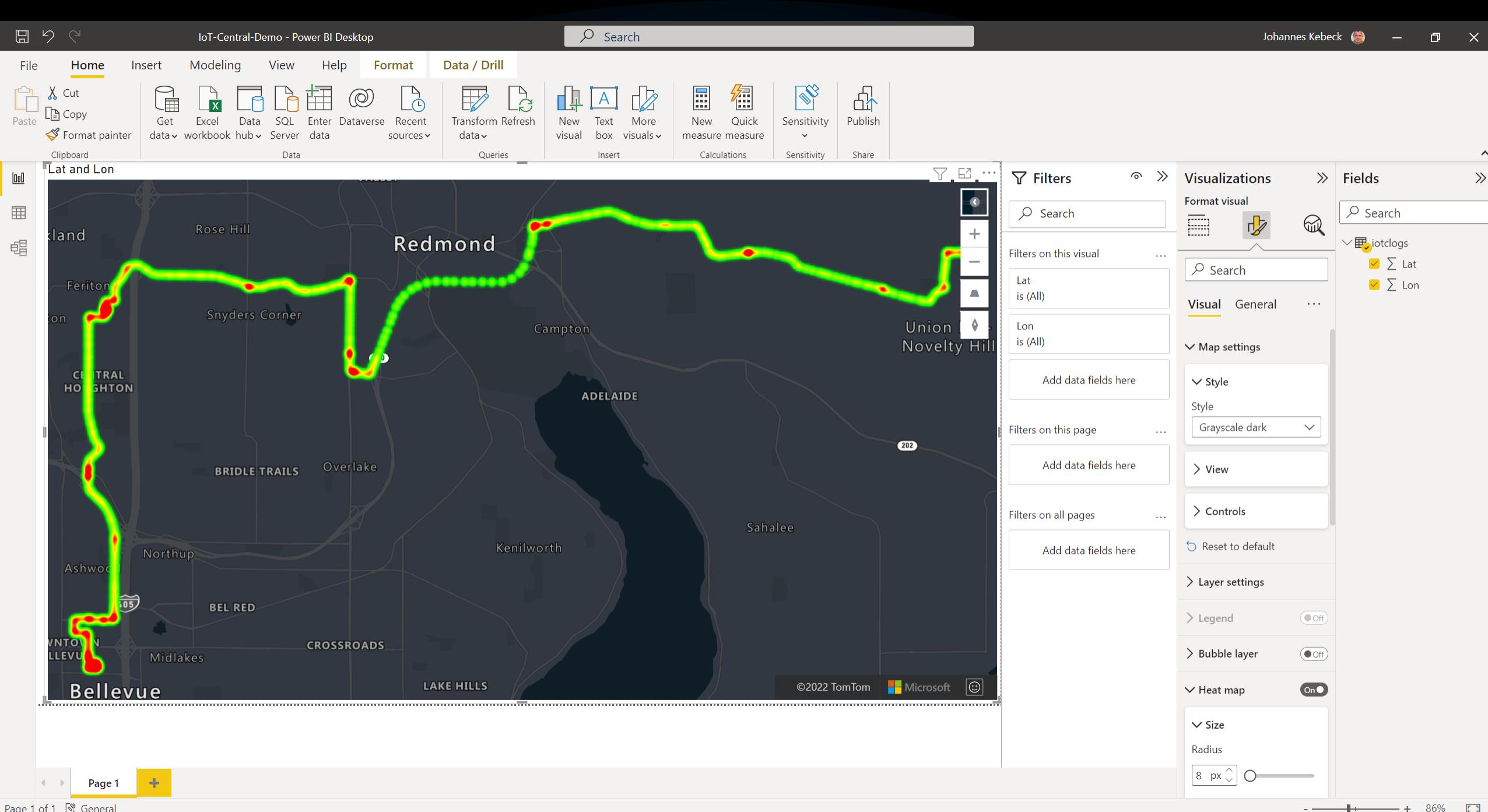
Cross-report

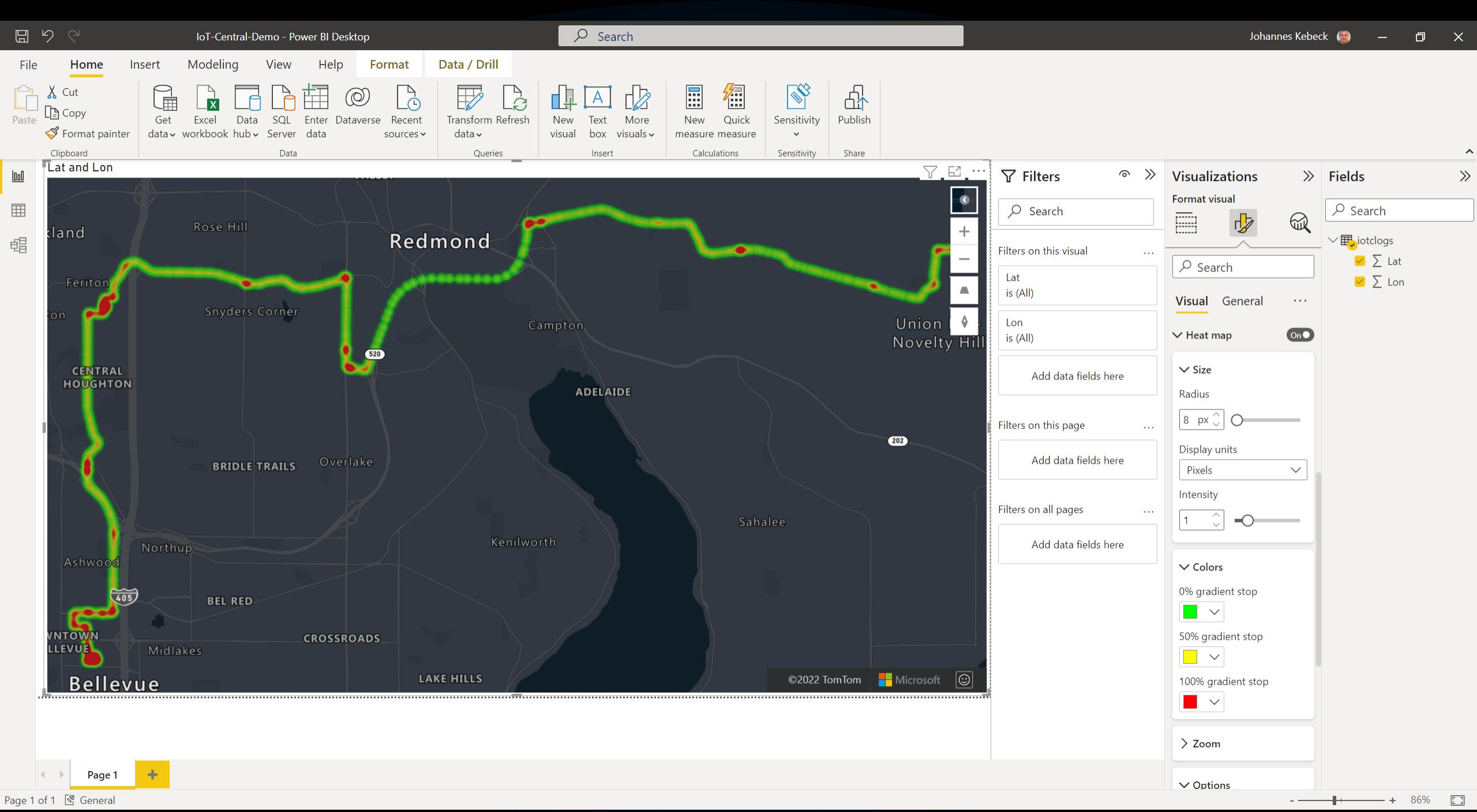
Page 1 +

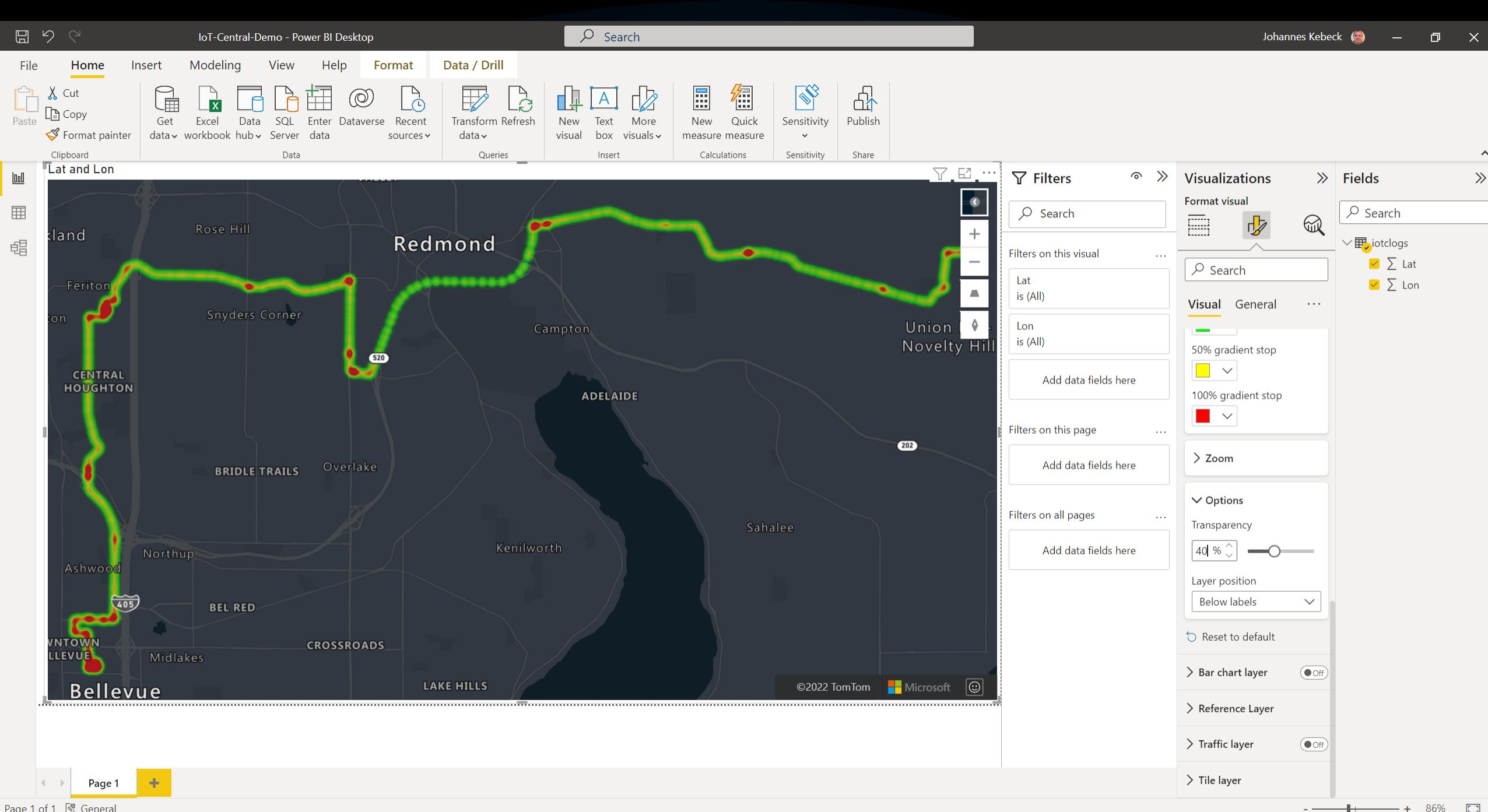
Page 1 of 1 General

86%

Search







IoT-Central-Demo - Power BI Desktop

File Home Insert Modeling View Help Format Data / Drill

Cut Copy Format painter Paste Clipboard

Get data workbook hub Data SQL Server Enter data Recent sources Transform Refresh data New visual Text box More visuals Insert New measure Quick measure Sensitivity Publish

Queries

Lat and Lon

Redmond

Feriton

Snyders Corner

Campton

Union Novelty Hill

CENTRAL HOUGHTON

BRIDLE TRAILS

Overlake

ADELAIDE

Kenilworth

Sahalee

Ashwood

Northup

BEL RED

VNTOWN LLEVUE

Midlakes

CROSSROADS

LAKE HILLS

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Page 1 +

Search

Filters

Visualizations

Fields

Format visual

General

Reset to default

Bar chart layer

Reference Layer

Traffic layer

Tile layer

Tile

URL: https://azurermapsdemos.

Tile size: 256 px

View

Zoom

Operations

Reset to default

Page 1 of 1 General 86%

This screenshot shows a map visualization titled "Lat and Lon" within the Power BI Desktop application. The map displays a heatmap representing location data across various Seattle suburbs. The heatmap is concentrated along major roads, such as I-90 and I-405, and shows higher density in central urban areas. The map includes labels for Redmond, Feriton, Snyders Corner, Campton, Union Novelty Hill, CENTRAL HOUGHTON, BRIDLE TRAILS, Overlake, ADELAIDE, Kenilworth, Sahalee, Ashwood, Northup, BEL RED, VNTOWN LLEVUE, Midlakes, CROSSROADS, and LAKE HILLS. The Power BI interface is visible, with the "Visualizations" pane open on the right, showing settings for the heatmap, including filters for "Lat" and "Lon", and options for "Bar chart layer", "Traffic layer", and "Tile layer". The "Fields" pane on the far right lists fields from the "iotlogs" table, including "Lat" and "Lon". The "Format visual" section of the "Visualizations" pane shows the current URL for the tile layer as "https://azurermapsdemos.". The overall layout includes the Power BI ribbon at the top, a search bar, and navigation controls at the bottom.

IoT-Central-Demo - Power BI Desktop

Johannes Kebeck

File Home Insert Modeling View Help Format Data / Drill

Cut Copy Format painter Paste Clipboard

Get data workbook hub Data SQL Server Enter data Recent sources Transform Refresh data New visual Text box More visuals Insert New measure Quick measure Sensitivity Publish

Lat and Lon

Rattlesnake Ledge elevation 2079'

LOCAL TRAILS

- TRAIL RATTLESNAKE LAKE LENGTH ¼ mile to Cedar River Watershed Education Center difficulty Very Easy users Foot, Bike, ADA Accessible
- TRAIL RATTLESNAKE LEDGE & MTN LENGTH ½ miles to Ledge difficulty Moderate to Difficult users Foot only
- TRAIL STATE PARK LENGTH 1½ miles to Snoqualmie Pass Tunnel difficulty Easy to Moderate users Foot, Bike, Horse
- TRAIL SNOQUALMIE VALLEY LENGTH 8 miles to North Bend difficulty Easy users Foot, Bike, Horse

MAP LEGEND

- Dirt Trail
- Gravel Trail
- Paved Road
- Locked Gate

Rattlesnake Lake elevation spec Cedar Falls Rd SE Cedar Falls Road SE State Park elevation 950' CEDAR FALLS Cedar River Watershed Education Center elevation 940'

The Cedar River Watershed Education Center connects people to the source of Seattle's drinking water and its unique cultural and natural history.

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Filters

Visualizations

Fields

Lat is (All)

Lon is (All)

Add data fields here

Filters on this page

Add data fields here

Filters on all pages

Add data fields here

URL https://azurermapsdemos.

Tile size 256 px

View

Zoom

Operations

Reset to default

Page 1

General

86%



Publish to Power BI

Select a destination

Search

My workspace

#VamoJuntoMicrosoft

*MSX Leader Insights

[External] TCS & Microsoft Connected Vehicle

1ES_CredentialReporting

1ES_LiveCorporateReporting

Select

Cancel



Publishing to Power BI

: Publishing 'IoT-Central-Demo.pbix' to Power BI



Did you know?

You can create a portrait view of your report, tailored for mobile phones.

On the **View** tab, select **Mobile Layout**. [Learn more](#)

Cancel



Publishing to Power BI

✓ Success!

[Open 'IoT-Central-Demo.pbix' in Power BI](#)

[Get Quick Insights](#)

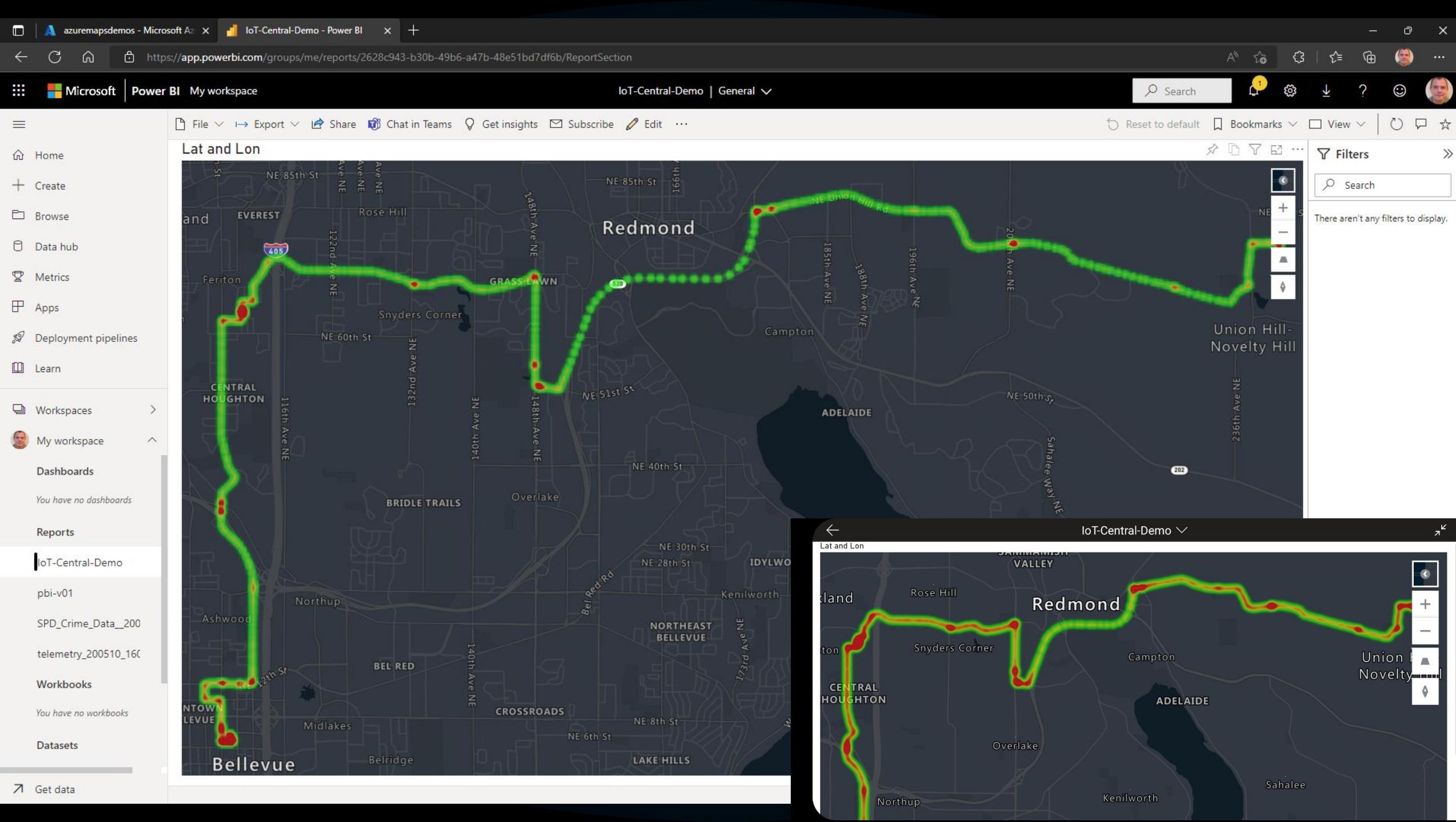


Did you know?

You can create a portrait view of your report, tailored for mobile phones.

On the **View** tab, select **Mobile Layout**. [Learn more](#)

[Got it](#)



Azure Maps Demos - Microsoft Az x IoT-Central-Demo - Power BI x Rattlesnake_Lake - OneDrive x | +

https://app.powerbi.com/groups/me/reports/2628c943-b30b-49b6-a47b-48e51bd7df6b/ReportSection

Microsoft | Power BI My workspace IoT-Central-Demo | General Search Reset to default Bookmarks View Filters Search There aren't any filters to display.

Lat and Lon

RATTLESNAKE LAKE RECREATION AREA

LOCAL TRAILS

- 1. CEDAR FALLS TRAIL: 0.5 miles to Cedar River Waterfall Education Center. Moderate to Very Easy terrain. ADA Accessible.
- 2. SQUAHLAHE POINT: 0.5 miles to Squahlahe Point Park. Moderate to Difficult terrain. ADA Accessible.
- 3. STATE PARK: 0.5 miles to Cedar Falls State Park. ADA Accessible.
- 4. SNOQUALMIE VALLEY: 0.5 miles to North Bond. Moderate to Very Easy terrain. ADA Accessible.

MAP LEGEND

Rattlesnake Lake

CEDAR FALLS

SE 176th St

SE 177th St

Cedar Falls Rd SE

SE Edgewick Rd

Lat and Lon

LOCAL TRAILS

- 1. CEDAR FALLS TRAIL: 0.5 miles to Cedar River Waterfall Education Center. Moderate to Very Easy terrain. ADA Accessible.
- 2. SQUAHLAHE POINT: 0.5 miles to Squahlahe Point Park. Moderate to Difficult terrain. ADA Accessible.
- 3. STATE PARK: 0.5 miles to Cedar Falls State Park. ADA Accessible.
- 4. SNOQUALMIE VALLEY: 0.5 miles to North Bond. Moderate to Very Easy terrain. ADA Accessible.

MAP LEGEND

Rattlesnake Lake

CEDAR FALLS

SE 176th St

SE 177th St

Cedar Falls Rd SE

SE Edgewick Rd

Cedar River Watershed Education Center elevation 940'

Home Create Browse Data hub Metrics Apps Deployment pipelines Learn Workspaces My workspace Dashboards You have no dashboards Reports IoT-Central-Demo IoT-v01 SPD_Crime_Data_200 telemetry_200510_160 Workbooks You have no workbooks Datasets Get data

Thank you

Resources

Learn more

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[Documentation & Tutorials](#)

[Samples](#)



