

Serverless Architecture with Azure Functions

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 @mallibone

 Noser Engineering AG

 Ambassador

 <https://mallibone.com>



NOSERENGINEERING
WE KNOW HOW

Microsoft
CERTIFIED
Solution Developer



A long-exposure photograph of a city street at night. The foreground shows a multi-lane road with light trails from cars, indicating movement. The middle ground features a wide highway with more light trails. In the background, several tall skyscrapers are illuminated with blue and white lights, standing against a dark night sky. The overall scene is a vibrant urban landscape.

Serverless Architecture



A nighttime photograph of a city street, likely in Shanghai, featuring a multi-lane highway with light trails from cars and tall, illuminated skyscrapers in the background. The text 'Service Oriented Architecture' is overlaid in white.

Service Oriented Architecture

A long-exposure photograph of a city street at night. The foreground shows a multi-lane road with light trails from cars, indicating movement. On the left, there are modern buildings with illuminated windows and balconies. On the right, a tall, slender skyscraper stands out against the dark sky. The overall scene is a vibrant urban landscape.

Service Oriented Architecture

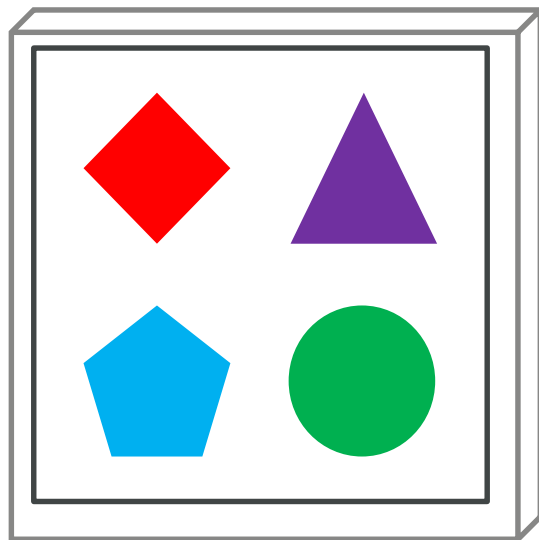
AND THEN THERE WAS



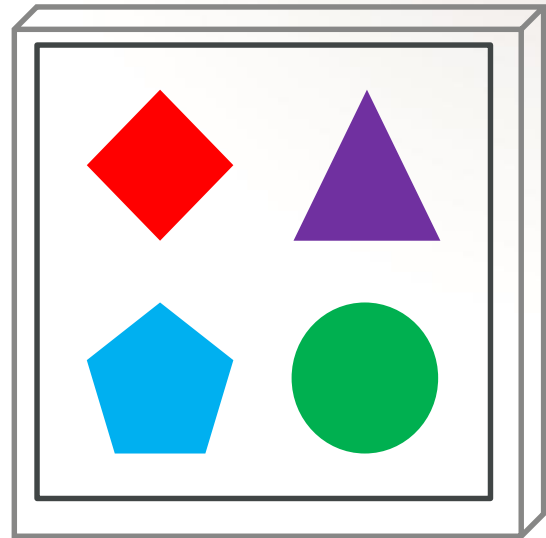
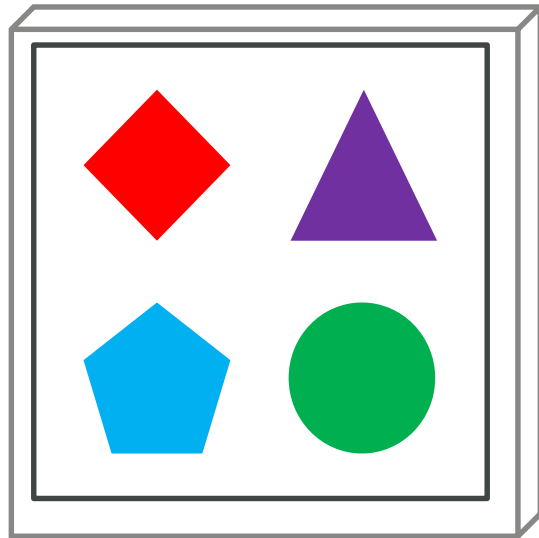
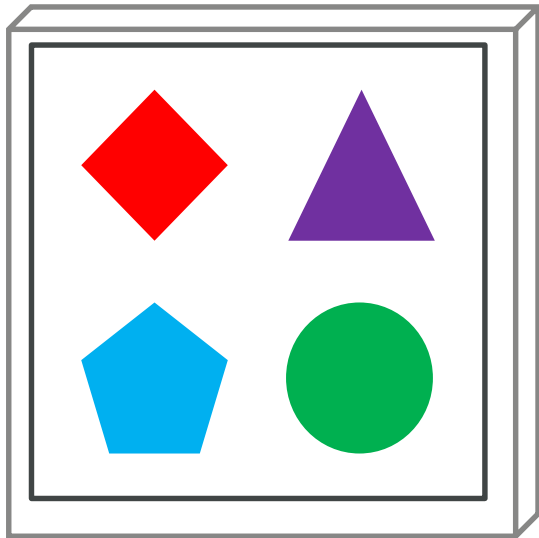
THIS GIANT MONOLITH

imgflip.com

A Monolith



Monolith at scale



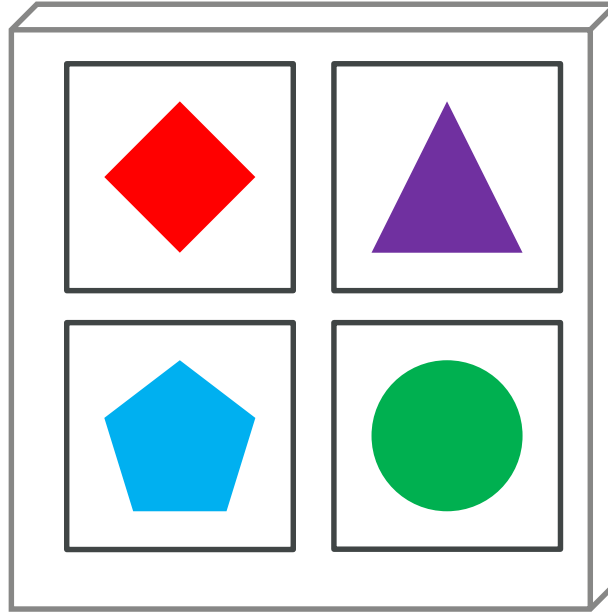


A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers with illuminated windows line the street. The word "Microservices" is overlaid in white text in the center.

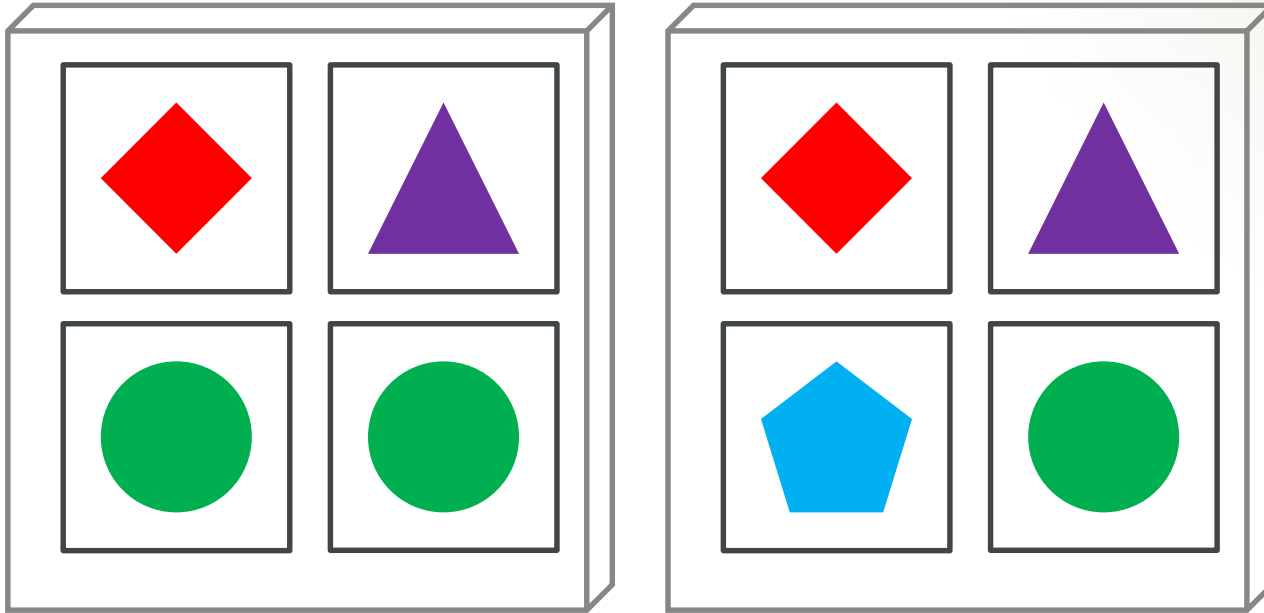
Microservices



Microservices



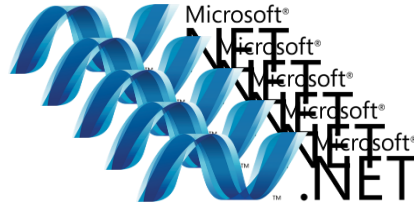
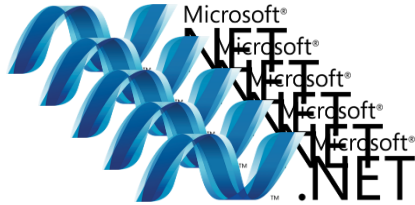
Scaling Microservices



A nighttime photograph of a city street, likely in Shanghai, featuring a multi-lane highway with light trails from cars. Tall skyscrapers with illuminated windows line the street. The text "Microservices: 'SOA done right'" is overlaid in white.

Microservices: "SOA done right"

In a world without Azure...



Web App

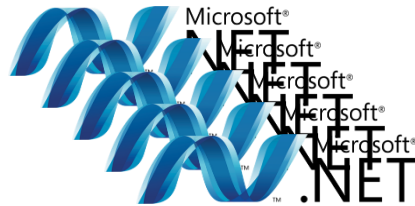
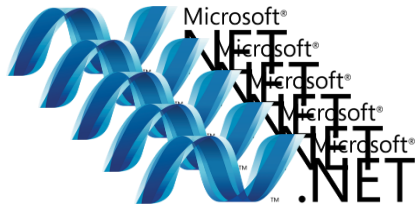


Webserver



Server





Web App



Azure App Service

A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers with illuminated windows line the street. The text "No Infrastructure setup" is overlaid in white. At the bottom, there are four white arrows pointing downwards, each positioned over a lane of traffic.

No Infrastructure setup

Minimal configuration

A nighttime photograph of a busy city street, likely in Shanghai, featuring tall skyscrapers and light trails from traffic. The text "Which service do we have to scale?" is overlaid in white.

Which service do we have to scale?



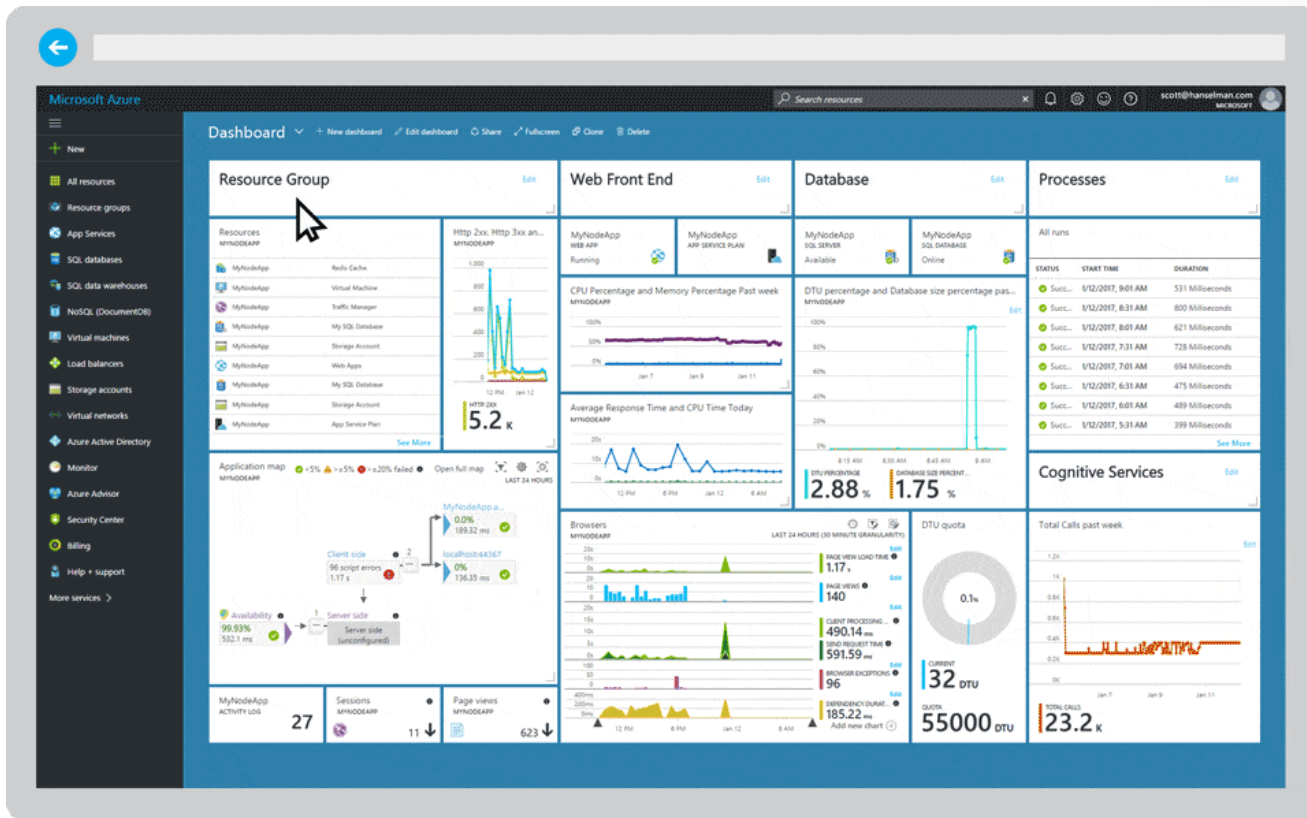
A long-exposure photograph of a city street at night. The street is filled with light trails from cars, creating a sense of motion. Tall skyscrapers line the street, their windows glowing with light. The sky is dark, and the overall atmosphere is urban and vibrant.

Developing and Scaling at Method Level



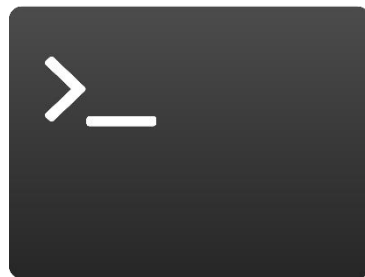
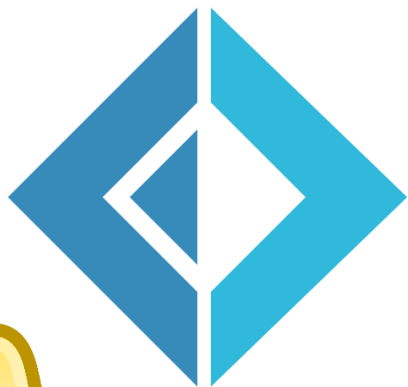
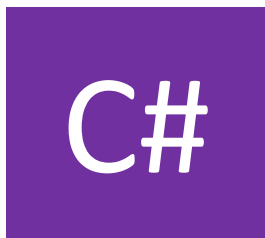


Azure Functions allows building
scalable reactive systems without the
setup hassle.



Demo





A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers line the street, their windows glowing with light. The overall scene is a vibrant urban landscape.

Easy setup

Search: "gnabber" ✕

All subscriptions ▾

Function Apps ↻

▼ ⚡ gnabber ↻ »

- ▼ Functions +
 - GenericWebhookFSharp1
 - HelloNuget
 - HelloWorld
 - StoreTicket
 - ⚡ Integrate
 - ⚙ Manage
 - 🔍 Monitor
- ▼ Proxies (preview) +
- ▼ Slots (preview) +

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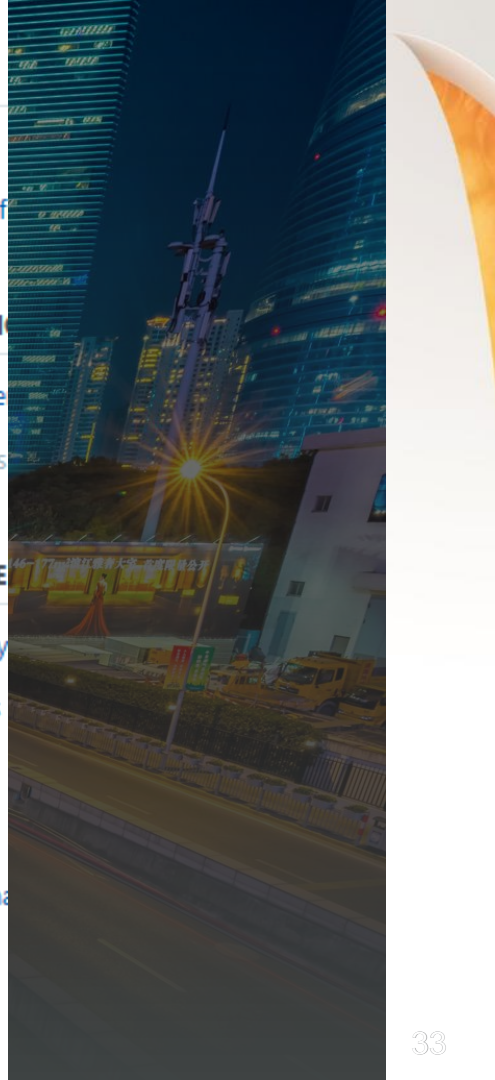
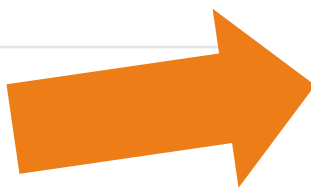
Activity

Access

Tags

Locks

Automate



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API def

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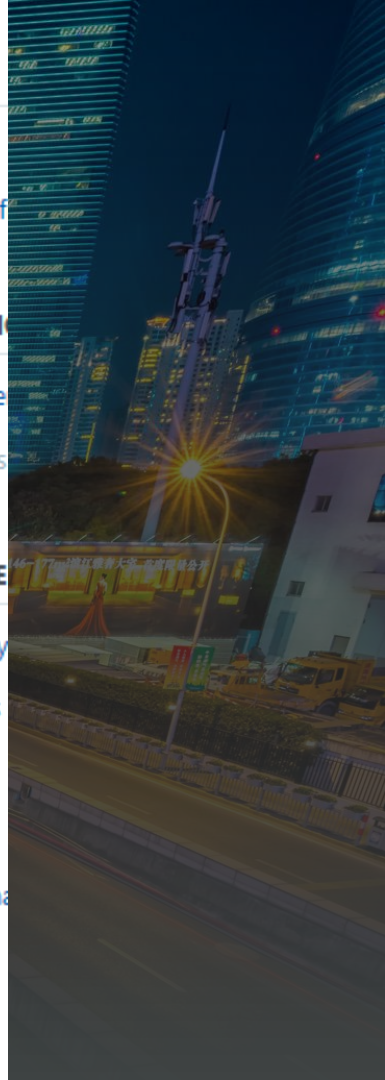
Activity

Access

Tags

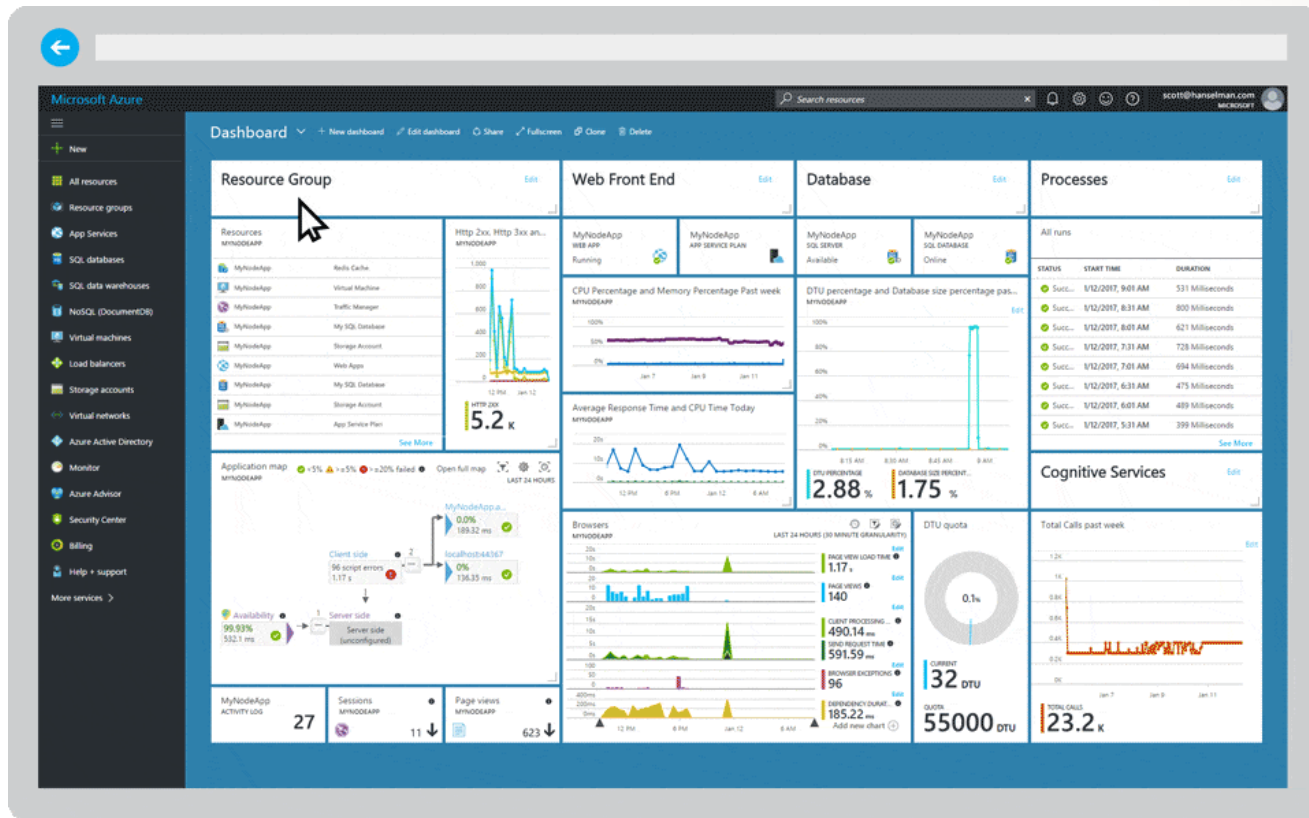
Locks

Autom

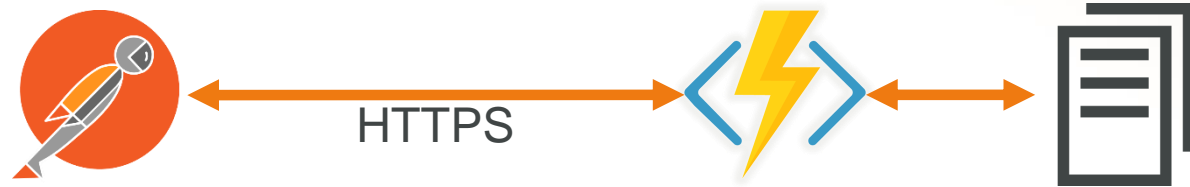


A nighttime photograph of a busy city street, likely in Shanghai, featuring a multi-lane highway with light trails from cars and tall, illuminated skyscrapers in the background. The text 'Sharing functionality between functions' is overlaid in white. A semi-transparent dark blue rectangle is at the bottom, containing four white arrows pointing downwards.

Sharing functionality between functions



Demo



A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers with illuminated windows line the street, and a bridge or overpass is visible in the distance. The overall scene is a vibrant urban nightscape.

What about NuGet?

project.json

Save

▶ Save and run

</> Get function URL

View files Test

+ Add ↑ Upload 🗑 Delete

StoreTicket

function.json

run.csx

project.json

```
1 {  
2   "frameworks": {  
3     "net46": {  
4       "dependencies": {  
5         "Newtonsoft.Json": "8.0.3"  
6       }  
7     }  
8   }  
9 }
```

project.json

Save

▶ Save and run

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1 {  
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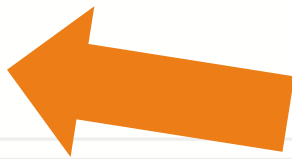

project.json

Save

▶ Save and run

</> Get function URL

```
1 {  
2   "frameworks": {  
3     "net46": {  
4       "dependencies": {  
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8   }  
9 }
```



View files Test

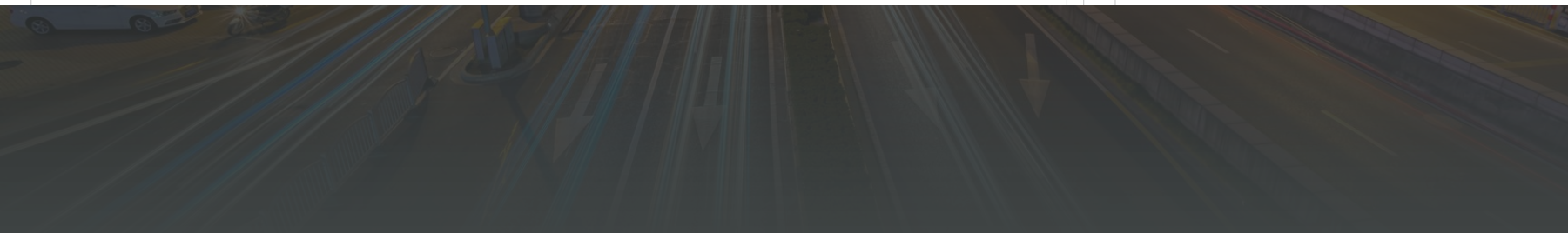
+ Add ↑ Upload 🗑 Delete

StoreTicket

function.json

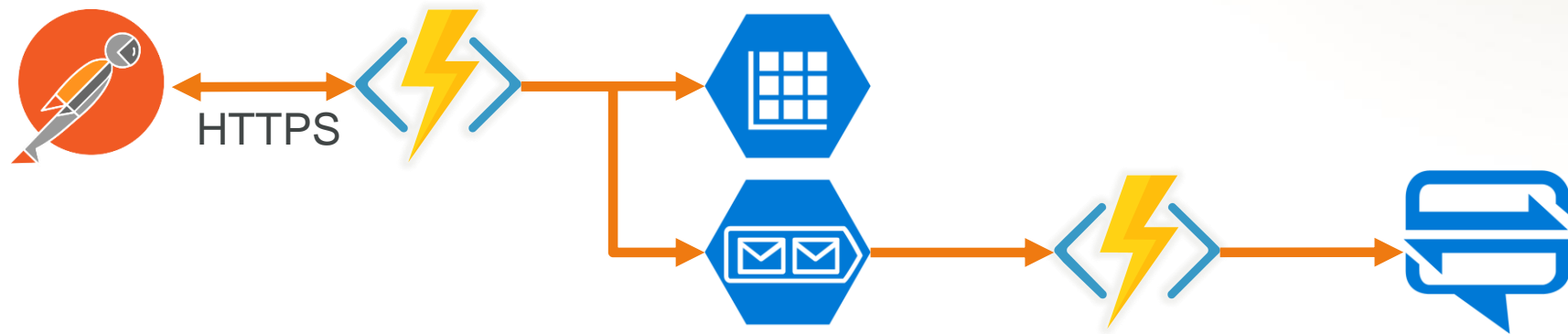
run.csx

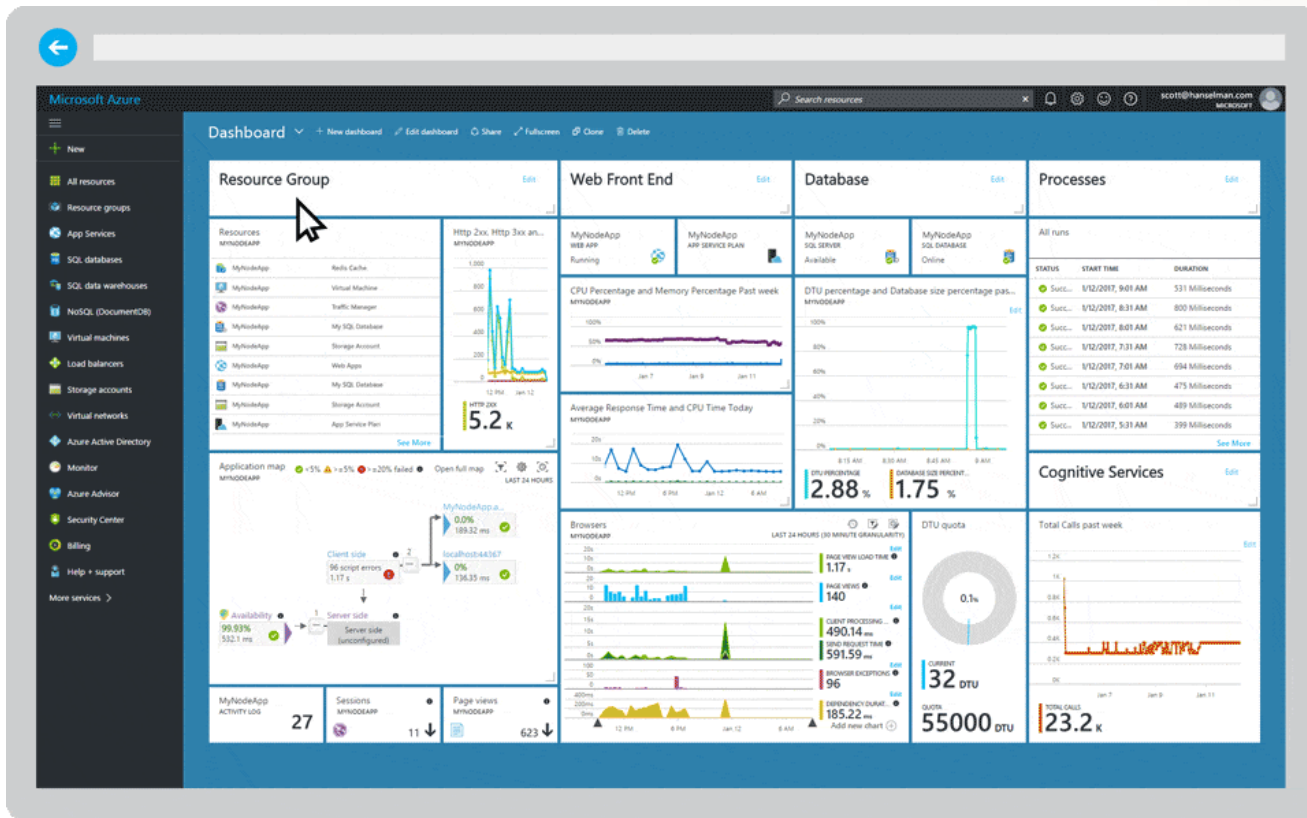
project.json



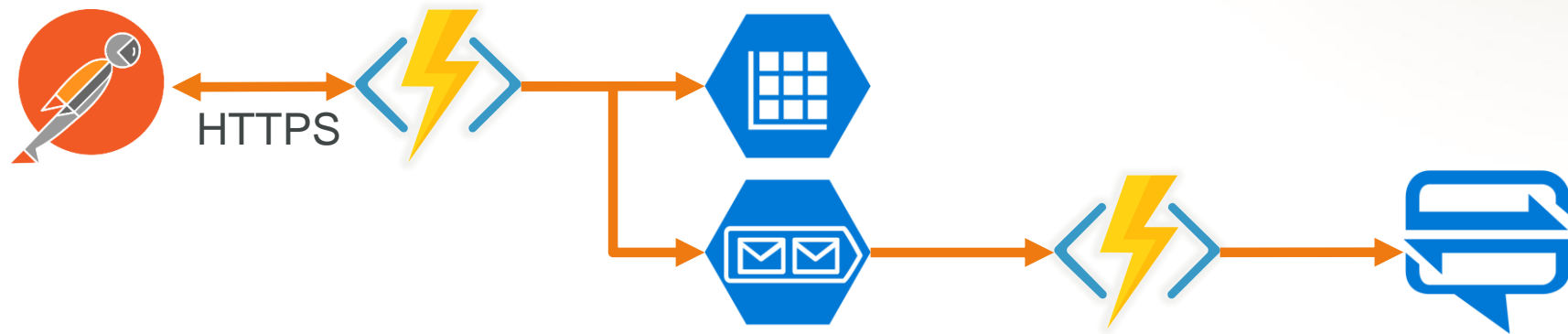
A nighttime photograph of a busy city street, likely in Shanghai, featuring a multi-lane highway with light trails from cars. Tall, modern skyscrapers with illuminated windows line the street. The text "Building a processing pipeline" is overlaid in white. A semi-transparent dark blue rectangle is at the bottom, containing three white downward-pointing arrows.

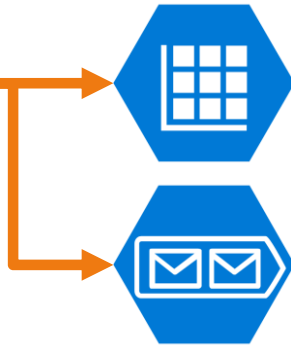
Building a processing pipeline





Demo







A long-exposure photograph of a city street at night. The foreground shows a multi-lane road with light trails from cars, indicating traffic flow. On the left, there are modern buildings with illuminated windows and balconies. On the right, a tall, slender skyscraper with a blue facade and many lit windows stands out against the dark sky. The overall scene is a vibrant urban nightscape.

Developing in VS Code

★ azure-functions-cli public



The Azure Functions CLI provides a local development experience for creating, developing, testing, running, and debugging Azure Functions.

Installing

NOTE: This package only currently works on Windows, since the underlying Functions Host is not yet cross-platform. You can upvote this GitHub issue if you're interested in running on other platforms: [make the Azure Functions CLI cross platform](#).

To install globally:

```
npm i -g azure-functions-cli
```

Aliases

The package sets up the following global aliases:

```
func
azfun
azure-functions
```

Unleash awesomeness

Private packages, team management tools, and powerful integrations. [Get started with npm Orgs](#)

`npm i -g azure-functions-cli`
[how? learn more](#)

ahmelsayed published a month ago

1.0.0-beta.94 is the latest of 20 releases

[github.com/Azure/azure-functions-cli](#)

MIT

Collaborators [list](#)



Stats

17 downloads in the last day

573 downloads in the last week

1'857 downloads in the last month

32 open issues on GitHub

No open pull requests on GitHub

Try it out

[Test azure-functions-cli in your browser](#)

C:\WINDOWS\System32\WindowsPowerShell\v1.0\Powershell.exe

C:\work\Talks\2017AzureFunctions>

C:\work\Talks\2017AzureFunctions> npm i -g azure-functions-cli

A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers line the street, their windows glowing with light. The overall scene is a vibrant urban landscape.

Create locally

```
C:\work\Talks\2017AzureFunctions> cd : \demo\functions\
C:\work\Talks\2017AzureFunctions\DemoFunctions> func
```

```
Azure Functions Cli (1.0.0-beta.94)
Function Runtime Version: 1.0.10826.0
Usage: func [context] [context] <action> [-/--options]
```

Contexts:

azure	Commands to log in to Azure and manage resources
function	Commands for creating and running functions locally
functionapp	Commands for working with a local function app
host	Commands for running the Functions host locally
settings	Commands for managing environment settings for the local Functions host

Actions:

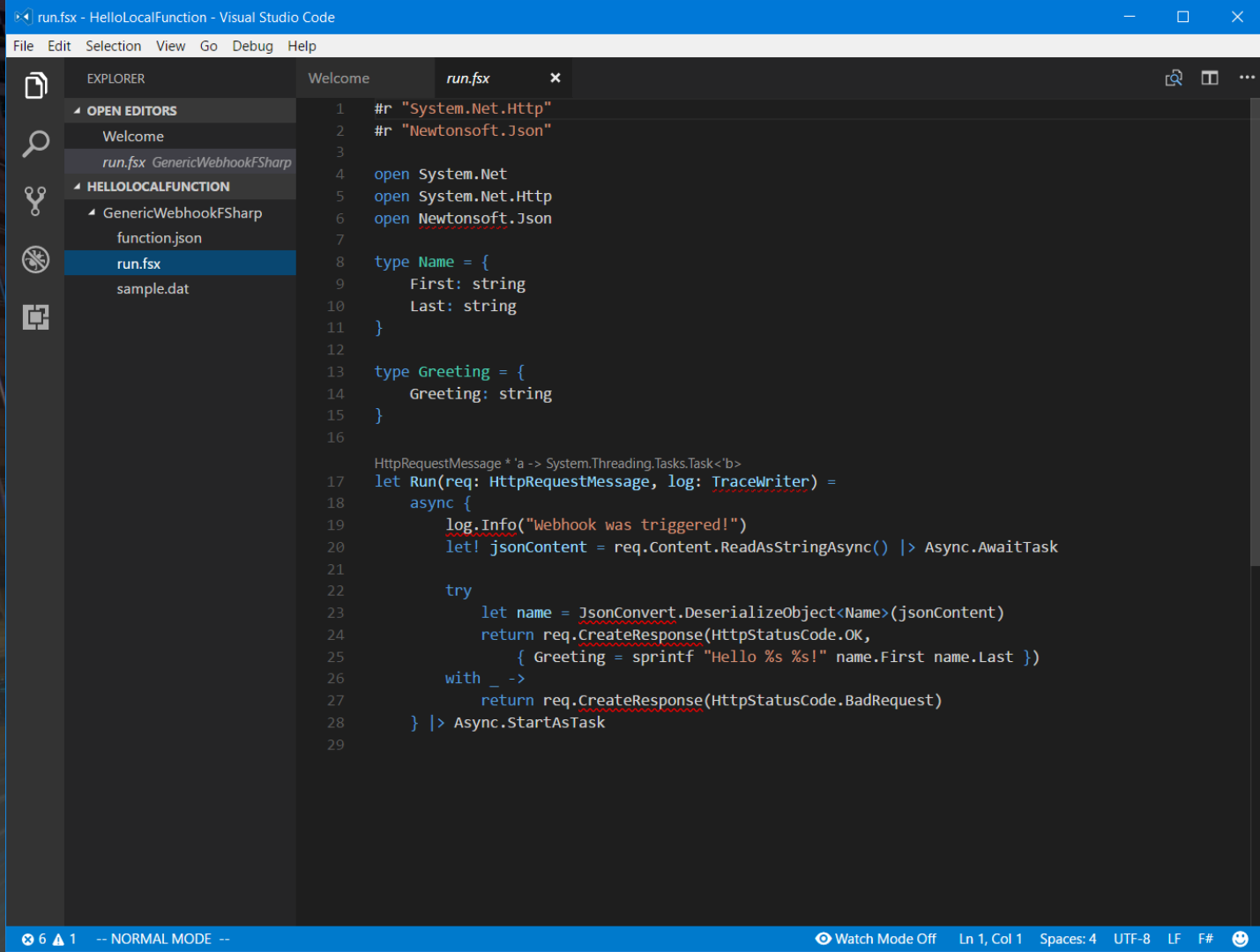
```
new      Create a new function from a template. Aliases: new, create
--language [-l] Template programming language, such as C#, F#, JavaScript, etc.
--template [-t] Template name
--name [-n]      Function name
```

```
init      Create a new Function App in the current folder. Initializes git repo. Aliases: init, create
```

```
run      Run a function directly
<FunctionName>  Function to run
--timeout [-t]  Time (in seconds) to wait until local Functions host is ready
--content [-c]  Inline content
--file [-f]     File name to use as content
--debug [-d]    Attach a debugger to the host process before running the function
```

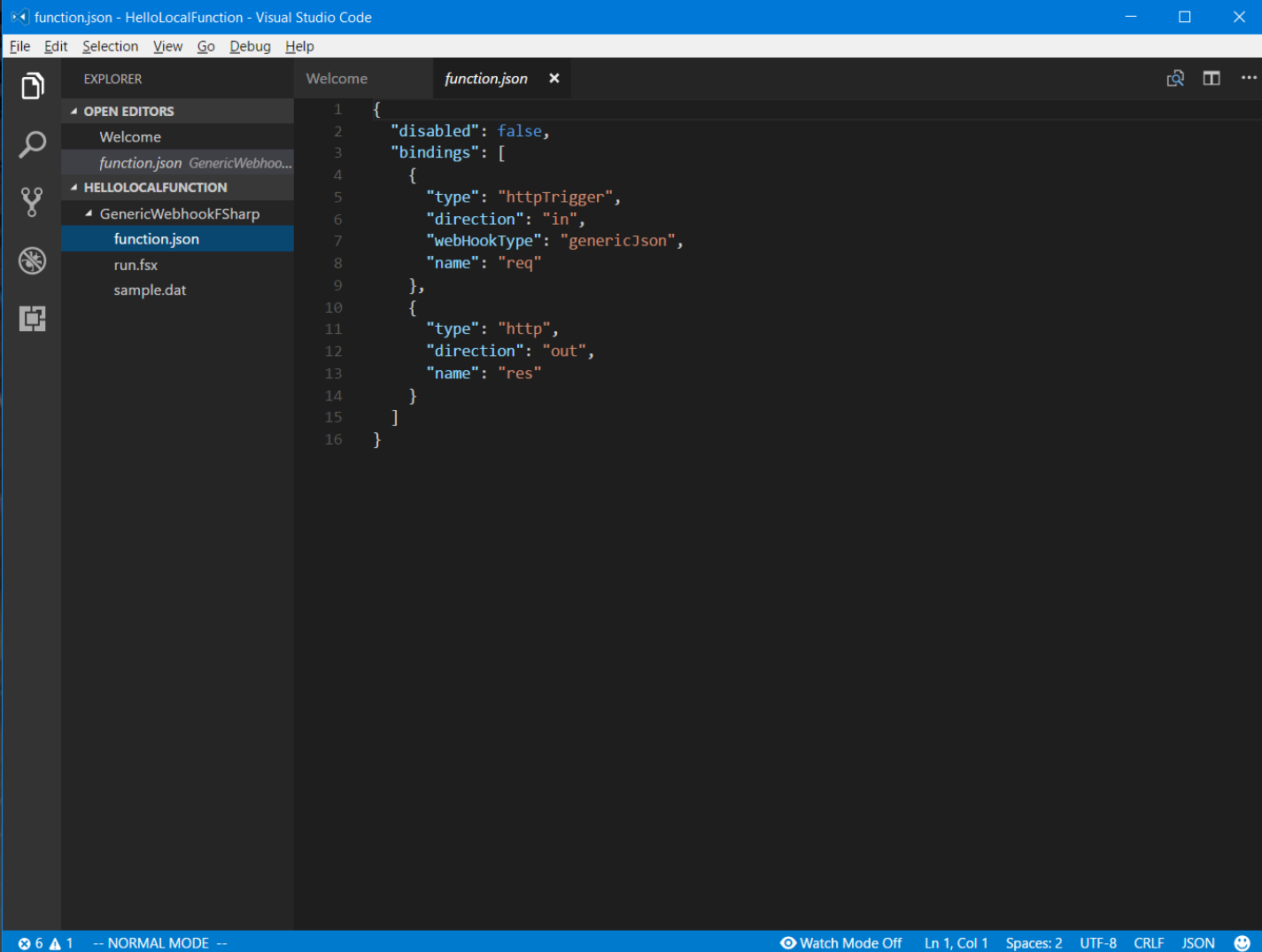

A long-exposure photograph of a city street at night. The street is filled with light trails from cars, creating a sense of motion. Tall skyscrapers line the street, their windows glowing with light. The sky is dark, and the overall scene is illuminated by city lights.

Edit



A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers line the street, their windows glowing with light. The overall scene is a vibrant urban nightscape.

Config



A long-exposure photograph of a city street at night. The street is filled with light trails from cars, creating a sense of motion. Tall skyscrapers line the street, their windows glowing with light. The sky is dark, and the overall scene is illuminated by city lights.

Run



I WANT ALL OF THE THINGS

SampleWebhook - Microsoft Visual Studio Preview

File Edit View Project Build Debug Team Tools Test Analyze Window Help

Debug Any CPU SampleWebhook

GenericWebHookCSharp.cs SampleWebhook.GenericWebHookCSharp Run(HttpRequestMessage req, TraceWriter log)

```
1 using System.Net;
2 using System.Net.Http;
3 using System.Threading.Tasks;
4 using Microsoft.Azure.WebJobs;
5 using Microsoft.Azure.WebJobs.Extensions.Http;
6 using Microsoft.Azure.WebJobs.Host;
7 using Newtonsoft.Json;
8
9 namespace SampleWebhook
10 {
11     0 references | 0 changes | 0 authors, 0 changes
12     public static class GenericWebHookCSharp
13     {
14         0 references | 0 changes | 0 authors, 0 changes
15         [FunctionName("GenericWebHookCSharp")]
16         public static async Task<object> Run([HttpTrigger(WebHookType = "genericJson")]HttpRequestMessage req, TraceWriter log)
17         {
18             log.Info($"Webhook was triggered!");
19
20             string jsonContent = await req.Content.ReadAsStringAsync();
21             dynamic data = JsonConvert.DeserializeObject(jsonContent);
22
23             if (data.first == null || data.last == null)
24             {
25                 return req.CreateResponse(HttpStatusCode.BadRequest, new
26                 {
27                     error = "Please pass first/last properties in the input object"
28                 });
29             }
30
31             return req.CreateResponse(HttpStatusCode.OK, new
32             {
33                 greeting = $"Hello {data.first} {data.last}!"
34             });
35         }
36     }
37 }
```

100 %

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense Search Error List

Code	Description	Project	File	Line	Suppression ST...
------	-------------	---------	------	------	-------------------

Error List Output

Solution Explorer

Search Solution Explorer (Ctrl+U)

Solution 'SampleWebhook' (1 project)

- SampleWebhook
 - Dependencies
 - GenericWebHookCSharp.cs
 - GenericWebHookCSharp
 - host.json
 - local.settings.json

Solution Explorer Team Explorer

Properties

A nighttime photograph of a busy city street, likely in Shanghai, featuring a multi-lane highway with prominent light trails from vehicles. Tall, modern skyscrapers with illuminated windows line the street. The scene is captured with a long exposure, creating a sense of motion and urban energy. The text "Visual Studio 2017.3 (Preview)" is overlaid in the center.

Visual Studio 2017.3 (Preview)



A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers line the street, their windows glowing with lights. The overall scene is a vibrant urban nightscape.

Deployment via Ctrl-C & Ctrl-V?



Push from Dev machine to
Production?



Deploying Code

A long-exposure photograph of a city highway at night. The image shows multiple lanes of traffic with light trails from cars, indicating movement over time. In the background, several tall skyscrapers are illuminated with blue and white lights, creating a vibrant urban skyline. The overall scene is a mix of modern architecture and dynamic traffic.

Search "gnabber" ✕

All subscriptions ▾

Function Apps ↻

▼ ⚡ gnabber ↻ »

▼ ≡ Functions +

- ▶ f GenericWebhookFSharp1
- ▶ f HelloNuget
- ▶ f HelloWorld
- ▼ f StoreTicket
 - ⚡ Integrate
 - ⚙ Manage
 - 🔍 Monitor
- ▼ ≡ Proxies (preview) +
- ▶ ≡ Slots (preview) +

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API definition (preview)

Search features

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- Deployment credentials

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- Log streaming
- Process explorer
- Security scanning

API

- CORS
- API definition

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- App Service plan
- Quotas

RESOURCE MANAGEMENT

- Activity log
- Access control (IAM)
- Tags
- Locks
- Automation script



hookFSharp1


W)




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Choose source



Visual Studio Team Services
By Microsoft



OneDrive
By Microsoft



Local Git Repository
By Git



GitHub
By GitHub



Bitbucket
By Atlassian



Dropbox
By Dropbox



External Repository

Publish via Git



Deployment option

Set up deployment option



* Choose Source
GitHub



* Authorization
mallibone



* Choose project
AzureFunctionsDemo



* Choose branch
master



Performance Test
Not Configured



Click here if you are having trouble
seeing your repositories.



Choose branch



develop

feature/GenerateQRCode




master

A long-exposure photograph of a city street at night. The image shows multiple lanes of traffic with light trails from cars and streetlights. Tall skyscrapers with illuminated windows line the street, and a bridge or overpass is visible in the distance. The overall scene is a vibrant urban nightscape.

Manage Deployments

Deployments

gnabber

 Setup  Sync  Disconnect  Configure Performance Test

TUE 05/23



Obvious coding error
GitHub
Inactive
7:04 AM





Update log
Active
7:08 AM



Add notification function
GitHub
Inactive
6:49 AM

Deployment Details

gnabber

 Redeploy  Delete

STATUS Building

TRIGGERED BY

AUTHOR mallibone

RAN FOR -425 seconds

REASON Update log

DEPLOY TO gnabber

STA..	TIME	ACTIVITY	LOG
✓	Tue 05/23	Updating submodules.	
✓	Tue 05/23	Preparing deployment for commit id '97e190d64e'.	
✓	Tue 05/23	Generating deployment script.	View Log
✓	Tue 05/23	Running deployment command...	View Log
✓	Tue 05/23	Running post deployment command(s)...	
✓	Tue 05/23	Syncing 7 function triggers with payload size 875 bytes	
✓	Tue 05/23	Deployment successful.	



Coding on a live environment...

Daily Usage Quota (GB-Sec)

Enter value in GB-sec

Set quota

Runtime version

Runtime version: latest (~1)

Proxies (preview)

Enable Azure Functions Proxies (preview)

Off

On

Function app edit mode

Change the edit mode of your function app

Read\Write

Read Only





Slots (preview)

Enable deployment slots (preview). This is a one-time opt-in on the Function app that cannot be disabled and will reset any pre-existing secrets. After the update, the secrets may be copied from under the **'Manage' node for each function**.

Off

On

Host Keys (All functions)

NAME	VALUE	ACTIONS		
_master	Click to show	 Copy	 Renew	
default	Click to show	 Copy	 Renew	 Revoke

Add new host key

Proxies (preview)

Enable Azure Functions Proxies (preview)

Off

On

Function app edit mode

Change the edit mode of your function app

Read\Write

Read Only



Slots (preview)

Enable deployment slots (preview). This is a one-time opt-in on the Function app that cannot be disabled and is copied from under the **'Manage' node for each function.**

Off

On

Host Keys (All functions)

NAME	VALUE
master	Click to show

A nighttime photograph of a city street, likely in Shanghai, featuring a multi-lane highway with light trails from cars. Tall skyscrapers with illuminated windows line the street. The text "Deploy from Code Repository" is overlaid in white. A semi-transparent dark blue rectangle is at the bottom, containing three white arrows pointing down. A stylized orange and white graphic is on the right edge.

Deploy from Code Repository

Takeaways

- Azure Functions are awesome
- More is coming!



Takeaways

- Easy setup, minimal configuration, great scalability for simple and complex pipelines
- Develop locally in Visual Studio Code or Visual Studio
- Deploy from Git Repository Branch and Roll Back if needed



Make your
Users Happy
by creating
responsive
apps that scale



Thank you for coming and happy coding!



@mallibone

DIGICOMP



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WE KNOW HOW



progile
productive not busy

trivadis
makes IT easier.





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Vielen Dank
für Ihre Aufmerksamkeit!

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