

# Using Azure Functions and CSOM to master SharePoint development

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# About the Speaker

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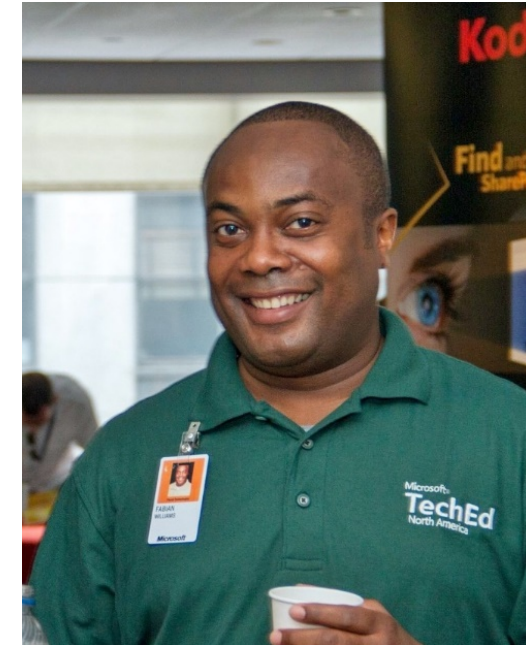
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What is this  
Azure Function  
you speak of?

How does  
Azure Function  
Work

Session  
Ingredients -  
High Level

Demo 1 –  
Runtime  
Experience

Deconstructing  
Demo 1

Exploring other  
Ideas of Azure  
Functions with  
SharePoint

Demo 2 –  
SharePoint Site  
Provisioning  
Azure Function

Q&A



# Why do this session? Why does this matter?

## What Problem does it solve?

TL;DR;

So, this is a leave behind /hand out.... If you were not present when I delivered this session this will help frame why I feel this topic is important.

- SharePoint Farm solutions are in the past & even if you have an On Premises environment, you should be writing solutions that are portable i.e. can work both On Prem & In the Cloud – Azure Functions give you that
- There are other options other than writing code to run in the Web Browser aka JavaScript that are available to back end developers [like myself] who for whatever reason or another don't want to keep up with with the cool kids 😊 -- Azure Functions give you that
- Azure Functions are multi faceted. What does that mean? I can use “THE SAME” Azure Faction that I write for my SharePoint solution for my Web Solution, for my Mobile Solution, for whatever else... do you know why? Its event driven. I look out for an interaction, I respond to it. Input/Output

\*\*\*STOP\*\*\*



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<https://github.com/fabianwilliams/azurefunctionsandcsom>



# What is an Azure Function? How do you define it?



- Azure Functions is a *serverless* compute service that enables you to run code on-demand without having to explicitly provision or manage infrastructure. Use Azure Functions to run a script or piece of code in response to a variety of events. <https://docs.microsoft.com/en-us/azure/azure-functions>
- *Serverless* is the abstraction of servers, it is computing in a cloud execution model where you dynamically manage resources and runtime execution rather than on premises capacity



# What is an Azure Function? How do you define it?



HTTP



Timer



Azure Cosmos DB



Blob



Queue



Visual Studio



Visual Studio Code

- No provisioning of Servers
- Fully managed compute platform that's scalable and secure
- Microservices approach to development, scalable and modular
- Triggers (event managing) and Bindings (integration)
- Develop within Azure IDE, Visual Studio, or VS Code



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# What is an Azure Function? How do you define it?



- Write in the language you know: You know C#, do C#, you know JavaScript do your JavaScript, & more F#, Python, PHP, etc
- Consumption model or App Service Plan model
- Use your own libraries i.e. NuGet, NPM, or upload your own DLL
- Backed by OAuth providers such as AAD, and other Social IDP
- Integrate with other SaaS, Develop simply in the Azure IDE or use full SDLC with CI/CD DevOps














# What is an Azure Function? How do you define it?

 <b>HTTP trigger</b>  A function that will be run whenever it receives an HTTP request, responding based on data in the body or query string  <b>C# F# JavaScript</b>	 <b>Timer trigger</b>  A function that will be run on a specified schedule  <b>C# F# JavaScript</b>	 <b>Queue trigger</b>  A function that will be run whenever a message is added to a specified Azure Storage queue  <b>C# F# JavaScript</b>
 <b>Service Bus Queue trigger</b>  A function that will be run whenever a message is added to a specified Service Bus queue  <b>C# F# JavaScript</b>	 <b>Service Bus Topic trigger</b>  A function that will be run whenever a message is added to the specified Service Bus Topic  <b>C# F# JavaScript</b>	 <b>Blob trigger</b>  A function that will be run whenever a blob is added to a specified container  <b>C# F# JavaScript</b>
 <b>Event Hub trigger</b>  A function that will be run whenever an event hub receives a new event  <b>C# F# JavaScript</b>	 <b>Cosmos DB trigger</b>  A function that will be run whenever documents change in a document collection  <b>C# JavaScript</b>	 <b>IoT Hub (Event Hub)</b>  A function that will be run whenever an IoT Hub delivers a new message for Event Hub-compatible endpoints  <b>C# F# JavaScript</b>



# What is an Azure Function? How do you define it?

 <b>Scheduled mail</b> A function that will periodically send emails <b>C#</b>	 <b>SendGrid</b> A function that sends a confirmation e-mail when a new item is added to a particular queue <b>C# F# JavaScript</b>	 <b>Face locator</b> A function that processes images and outputs the bounding rectangle of faces using Cognitive Services <b>C# F# JavaScript</b>	
 <b>Image resizer</b> A function that creates resized images whenever a blob is added to a specified container <b>C# F#</b>	 <b>SAS Token Generator</b> A function that generates a SAS token for a given Azure Storage container and blob name <b>C#</b>	 <b>Manual trigger</b> A function that is triggered manually via the portal "Run" button	
	 <b>Application Insights scheduled digest</b> A function that sends a daily Application Insights telemetry report via email <b>C#</b>	 <b>External file trigger</b> A function that will be run whenever a file is added to an external file store <b>C# F# JavaScript</b>	 <b>External table</b> A function that will be run whenever data is added to an external table store <b>C# F#</b>
	 <b>Event Grid trigger</b> A function that will be run whenever an event grid receives a new event <b>C# JavaScript</b>	 <b>Serverless Community Library (Preview)</b> Not finding what you're looking for? Check out the Azure Serverless Community Library!	



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# What do you need to do this



1. Set up and create your Azure Function
2. Create a Certificate that you will use for the Authentication in Azure AD. This is the broker that will identify the Azure Function with SharePoint Online
3. Stub out your Azure Function App to get the full URI
4. Register your Application [the Azure Function] in Azure AD
5. Grant the permission to your Application to work within your SharePoint (or other Azure backed workloads) environment
6. Finish Code your solution however you would like to, in the Azure Function IDE, VS, VSCode etc.



# What do you need to do this

1. Provide a unique name which will become your endpoint URI for your function
2. Choose the subscription you want to use
3. Choose or create a Resource Group
4. I haven't done a Linux OS one yet TBH
5. This is the choice between FREE & azure will do its best to stay awake & responsive "or" you allocate resource you will pay for & it will be performant and ready
6. Standard stuff
7. The function is backed by a storage account so choose one or create one. I typically will have a resource group already set up with storage so I keep everything easy to find and named similar but unique



# Making of the Cert

#From Kirk Evans Blog

# <https://blogs.msdn.microsoft.com/kaevans/2016/08/12/using-powershell-with-certificates/>

```
$cert = New-SelfSignedCertificate -KeyExportPolicy Exportable `
-Provider "Microsoft Strong Cryptographic Provider" `
-Subject "CN=FabianSPOOfficeFiles" `
-NotBefore (Get-Date) `
-NotAfter (Get-Date).AddYears(2) `
-CertStoreLocation "cert:\CurrentUser\My" `
-KeyLength 2048
```

```
Export-Certificate -Type CERT -Cert $cert -FilePath "C:\1fabsCert\FabsWillyPrivateCertDemo1.cer"
```

```
$cred = Get-Credential
```

```
Export-PfxCertificate -Cert $cert -Password $cred.Password -FilePath "C:\1fabsCert\FabsWillyPrivateCertDemo1.pfx"
```



# Read back information from the Cert

```
Export-Certificate -Type CERT -Cert $cert -FilePath "C:\1fabsCert\FabsWillyPrivateCertDemo1.cer"
```

```
$cred = Get-Credential
```

```
Export-PfxCertificate -Cert $cert -Password $cred.Password -FilePath "C:\1fabsCert\FabsWillyPrivateCertDemo1.pfx"
```

```
$fabswillycer = New-Object System.Security.Cryptography.X509Certificates.X509Certificate2
```

```
$fabswillycer.Import("C:\1fabsCert\FabsWillyPrivateCertDemo1.cer")
```

```
$bin = $fabswillycer.GetRawCertData()
```

```
echo $bin
```

```
$base64Value = [System.Convert]::ToBase64String($bin)
```

```
echo $base64Value
```

```
$bin = $fabswillycer.GetCertHash()
```

```
$base64Thumbprint = [System.Convert]::ToBase64String($bin)
```

```
echo $base64Thumbprint
```

```
$keyid = [System.Guid]::NewGuid().ToString()
```

```
echo $keyid
```

```
$startDate = $($fabswillycer.NotAfter.ToString("s"))
```

```
echo $startDate
```





# Register your Application (the Azure Function App)

The screenshot illustrates the process of registering a new application in the Microsoft Azure portal. It is divided into three numbered steps:

- Step 1:** In the left-hand navigation pane, click on **App registrations** under the **Manage** section.
- Step 2:** In the top navigation bar of the **JahMekYan Enterprises - App registrations** page, click on **New application registration**.
- Step 3:** In the **Create** dialog box, fill in the following details:
  - Name:** DemoWareOne
  - Application type:** Web app / API
  - Sign-on URL:** kzS8e1Op7HoGf4bMLB00fqZChdrUiZLN ...Click the **Create** button at the bottom.

# Set the Required Permissions on the App

The screenshot displays the Microsoft Azure portal interface for configuring an app registration. The left sidebar shows the navigation menu with the 'AzureFuncCsom1' app selected. The main content area is divided into two panels: 'Required permissions' and 'Enable Access'.

**Required permissions**

API	APPLICATION PERMI...	DELEGATED PERMIS...
Office 365 SharePoint Online	2	0
Windows Azure Active Directory	0	1

**Enable Access**

Office 365 SharePoint Online

Save Delete

☐ APPLICATION PERMISSIONS

	REQUIRES ADMIN
<input checked="" type="checkbox"/> Read user profiles	Yes
Read and write user profiles	Yes
Read and write managed metadata	Yes
Read managed metadata	Yes
Read and write items and lists in all site collections	Yes
Have full control of all site collections	Yes
Read items in all site collections	Yes
<input checked="" type="checkbox"/> Read and write items in all site collections	Yes

☐ DELEGATED PERMISSIONS

	REQUIRES ADMIN
Read user profiles	Yes
Read and write user profiles	Yes
Read and write user files	No
Read user files	No
Have full control of all site collections	Yes
Read and write items and lists in all site collections	No

Home > csomfun - b\_SubWebCreationUtil

## csomfun - b\_SubWebCreationUtil

Function Apps

Search

All subscriptions

Function Apps

- affspv1fabs
- csomfun
  - Functions
    - a\_DisplaySPOOfficeFiles
    - Integrate
    - Manage
    - Monitor
    - b\_SubWebCreationUtil
      - Integrate
      - Manage
      - Monitor
      - Proxies
      - Slots (preview)
      - fabhw
      - fabsFAIgnite2017K2
      - fabsfunctalpha

run.csx

```

1 #r "Newtonsoft.Json"
2 #load "..\shared\
3
4 using Microsoft.IdentityModel.Clients.ActiveDirectory;
5 using Microsoft.SharePoint.Client;
6 using System.Net;
7 using System.Text;
8 using Newtonsoft.Json;
9
10 public class Cre
11 {
12     public string
13     public string
14     public string
15     public string
16     public string
17     public string
18     public string
19 }
20
21 public static as
22 {
23     log.Info("C#
24
25     string jsonO
26     var pl = Jsc
27     log.Info($"S
28
29     //ClientResu
30     try {
31         // Get t
32         using (v
33         {
34             WebC
35
36             WebC

```

Kudu Environment Debug console Process explorer Tools Site extensions

Save Cancel csomHelper.csx

```

1 using Microsoft.IdentityModel.Clients.ActiveDirectory;
2 using Microsoft.SharePoint.Client;
3 using System.Security.Cryptography.X509Certificates;
4
5 public static class csomHelper {
6
7     private static string ClientId = "dc82469b62f7";
8     private static string Cert = "FabianWilliamsPrivateCert.pfx"; // Fill in name
9     private static string CertPassword = " " // TODO: Explore more secure place for this
10    private static string Authority = "https://login.windows.net/fabswilly.onmicrosoft.com/";
11    private static string Resource = "https://fabswilly.sharepoint.com/";
12
13    public async static Task<ClientContext> GetClientContext(string siteUrl)
14    {
15        var authenticationContext = new AuthenticationContext(Authority, false);
16
17        // TODO: Substitute your Azure function name for GetDocUrl2 below:
18        var certPath = Path.Combine(Environment.GetEnvironmentVariable("HOME"), "site\\wwwroot\\shared\\
19        var cert = new X509Certificate2(System.IO.File.ReadAllBytes(certPath),
20            CertPassword,
21            X509KeyStorageFlags.Exportable |
22            X509KeyStorageFlags.MachineKeySet |
23            X509KeyStorageFlags.PersistKeySet);
24
25        var authenticationResult = await authenticationContext.AcquireTokenAsync(Resource, new ClientAs
26        var token = authenticationResult.AccessToken;
27
28        var ctx = new ClientContext(siteUrl);
29        ctx.ExecutingWebRequest += (s, e) =>
30        {
31            e.WebRequestExecutor.RequestHeaders["Authorization"] = "Bearer " + authenticationResult.Acc
32        };
33
34        return ctx;
35    }
36 }

```



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Demo 1

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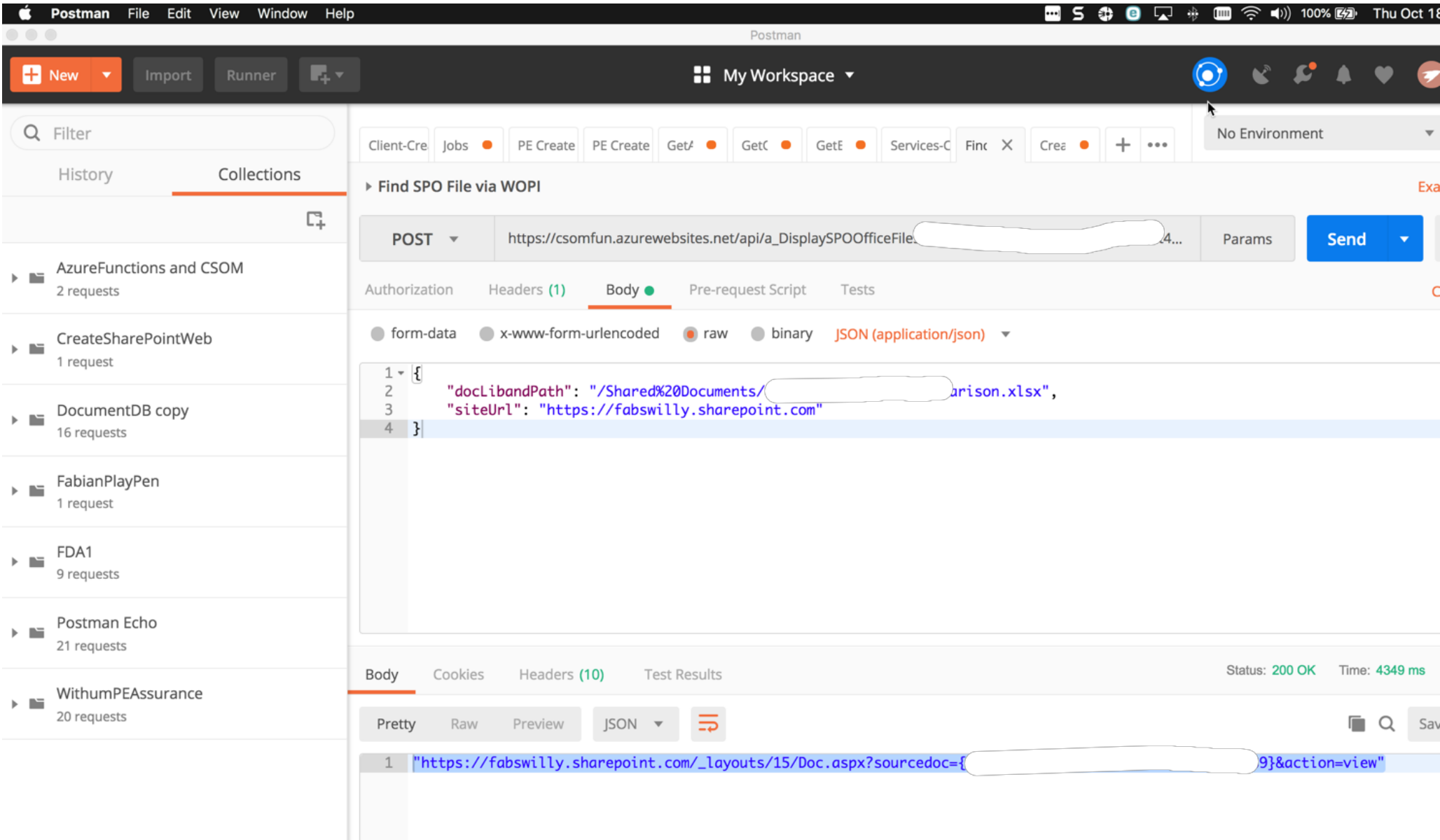
Demo 2 –  
SharePoint Site  
Provisioning  
Azure Function

Q&A

## DEMO 1

Give Access to a SharePoint Online Document based on Input from the user

# Demo 1 Leave Behind



# Demo 1 Leave Behind

App registrations - Microsoft Az X

Site Contents X

Site Contents X

← → ↺ 🏠

🔒 https://fabswilly.sharepoint.com/:x:/r/\_layouts/15/Doc.aspx?sourcedoc={c0c

🗖️ Excel Online

JahMekYan Enterprises Team Site ▶ Shared Documents

SharegateMetalogixComparison

	A	B	C
1	Topic	Metalogix	Sharegate
2		Diagnostic Manager	Standard Migration
3		<b>Content Matrix</b>	Nintex Migration



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Session  
Ingredients -  
High Level

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Runtime  
Experience

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Demo 1

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SharePoint Site  
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Azure Function

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# Questions you may have

- What is csomHelper.csx and why do you need it?
  - Answer in session
- What are the use cases for a function like this?
  - Think mobile app or web app something where SPO is an external resource
- Note that I am using 'QueryString' in one example and 'POST' with message body payload in the other.
  - Oversimplified??? Yes. But it illustrates the point of making CSOM Calls.. The next demo we will be creating a Web Site so that's a bit more meaningful & we will use a complex object



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Ingredients -  
High Level

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Runtime  
Experience

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Demo 1

Exploring other  
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Functions with  
SharePoint

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SharePoint Site  
Provisioning  
Azure Function

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# What else can I do? What is available to me?

- Lets take a look in the portal for the Triggers and Bindings in ways Ive used it before
- Lets take a look at Advanced Kudu Options and the other Areas I have not even touched yet



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High Level

Demo 1 –  
Runtime  
Experience

Deconstructing  
Demo 1

Exploring other  
Ideas of Azure  
Functions with  
SharePoint

Demo 2 –  
SharePoint Site  
Provisioning  
Azure Function

Q&A

# Demo 2 – Leave behind

The screenshot displays the Postman application interface on a macOS system. The top menu bar includes 'Postman', 'File', 'Edit', 'View', 'Window', and 'Help'. The main toolbar features buttons for 'New', 'Import', 'Runner', and 'My Workspace'. The left sidebar shows a 'Filter' search bar and a 'Collections' list with items like 'AzureFunctions and CSOM', 'CreateSharePointWeb', 'DocumentDB copy', 'FabianPlayPen', 'FDA1', 'Postman Echo', and 'WithumPEAssurance'. The main workspace is titled 'Create SPO Site via AzFunc CSOM' and shows a 'POST' request to 'https://csomfun.azurewebsites.net/api/b\_SubWebCreationUtil?code=TL3ss...'. The request body is set to 'JSON (application/json)' and contains a JSON object with fields: 'scUrl', 'title', 'description', 'url', and 'template'. The bottom status bar indicates a successful response: 'Status: 200 OK', 'Time: 9529 ms', and 'Size: 182 B'.

Postman

File Edit View Window Help

Postman

New Import Runner +

My Workspace

No Environment

Filter

History Collections

AzureFunctions and CSOM  
2 requests

CreateSharePointWeb  
1 request

DocumentDB copy  
16 requests

FabianPlayPen  
1 request

FDA1  
9 requests

Postman Echo  
21 requests

WithumPEAssurance  
20 requests

Client-Cre Jobs PE Create PE Create Get/ GetC GetE Services-C Find SPO I Crea + ...

Create SPO Site via AzFunc CSOM

POST https://csomfun.azurewebsites.net/api/b\_SubWebCreationUtil?code=TL3ss... Params Send Save

Authorization Headers (1) Body Pre-request Script Tests

form-data x-www-form-urlencoded raw binary JSON (application/json)

```
1 {  
2   "scUrl" : "https://fabswilly.sharepoint.com",  
3   "title" : "PreSPSBMore Demo Code",  
4   "description" : "fabtester SPSbmore1 from Chrome Postman ",  
5   "url" : "prespsbmore1",  
6   "template" : "STS#0"  
7 }
```

Body Cookies Headers (7) Test Results

Status: 200 OK Time: 9529 ms Size: 182 B

Pretty Raw Preview Text

Save Response

# Demo 2 – Leave behind

The screenshot shows a web browser window with multiple tabs. The active tab is 'Site Contents'. The address bar shows the URL: [https://fabswilly.sharepoint.com/\\_layouts/15/viewlsts.aspx?view=15](https://fabswilly.sharepoint.com/_layouts/15/viewlsts.aspx?view=15). The user is logged in as 'fabian@fabswilly'. The page header shows 'Office 365 | SharePoint'. The main content area displays the 'JahMekYan Enterprises Team Site'. On the left, there is a navigation pane with links to Home, Notebook, Documents, Pages, Site contents, and Recycle bin. The main area shows a list of subsites under the 'Subsites' tab. The list has columns for Name, Description, Views, and Created. Two red arrows point to the 'Name' and 'Description' columns.

Name	Description	Views	Created
PreSPSBMore Demo Code	fabtester SPSbmore1 from Chrome Postman		21 minutes ago
SPC 19 Pre Demo Code	fabtester1 from Chrome Postman		26 days ago

# Demo 2 – Leave behind

App registrations - Microsoft A

Site Contents

Site Contents

PreSPSBMore Demo Code - Ho

+

→

✕

🏠

🔒

https://fabswilly.sharepoint.com/prespsbmore1/SitePages/Home.aspx

fabian@fabswilly

...

🔍

☆

|||

Office 365

SharePoint

⚙️

WSE

PAGE

🔄 SHARE

☆ FOLLOW

S

Home

✎ EDIT LINKS

PreSPSBMore Demo Code

Search this site

ne

📖

📄

es

📁 contents

🗑️ycle Bin

EDIT LINKS

Get started with your site

REMOVE THIS

🔄

Share your site.

📋

Working on a deadline?

🏠

Add lists, libraries, and other apps.

🎨

What's your style?

🖼️

Your site. Your brand.

Newsfeed

Start a conversation

It's pretty quiet here.

Invite more people to the site, or start a conversation.

Documents

➕ New

📶 Upload

🔄 Sync

🔄 Share

More

Find a file

🔍

✓

📄 Name

Drag files here to upload

## DEMO 2

Auto Provisioning a SharePoint Site using Azure Functions. Use Case is a Tweet, a Slack Message, a MS Flow, tons of reason you want outside influence to manipulate internal protected resources





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Experience

Deconstructing  
Demo 1

Exploring other  
Ideas of Azure  
Functions with  
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Demo 2 –  
SharePoint Site  
Provisioning  
Azure Function

Q&A

