Azure

236504 – winter 2016/17

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SI CALOREM NON TOLERAS E CVLINA EXI
Today’s lecture is about:

• Microsoft Azure Cloud Computing.
Microsoft Azure
Cloud Computing
What Is Cloud Computing?
Advantages of Cloud Computing

- “Unlimited resources”
- Scale on demand
  - #clients
  - #services
- Out of the box infrastructure
- Redundant (geographical)
- Less deployment management
Azure Features

• Integrated into Visual Studio
• Many services in one place
• App Service
  • Has API for both tables and custom APIs
  • General computing - because Arduino computational resources are limited
• Connects to both Windows Phone and WeMos/NodeMCU (and Arduino with Ethernet shield)
The Azure portal

- Azure control panel: https://portal.azure.com/
- Each team was required to activate its Azure pass.
- You need Visual Studio 2015 community or newer. You can get it from MSDNAA: https://elms/cs/technion.ac.il/
Azure App Service

- **WEB APPS**
  Web apps that scale with your business

- **MOBILE APPS**
  Build Mobile apps for any device

- **LOGIC APPS**
  Automate business process across SaaS and on-premises

- **API APPS**
  Easily build and consume APIs in the cloud
Mobile Service Software Stack

Client
- App
- Proxy
- JSON / XML
- HTTP

Cloud
- Service
- Controller
- Controller
- JSON / XML
- HTTP

HTTP

JSON / XML

Controller

Controller
Table Controller Tutorial

<table>
<thead>
<tr>
<th>NAME</th>
<th>PUBLISHER</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile App</td>
<td>Microsoft</td>
<td>Web + Mobile</td>
</tr>
<tr>
<td>Mobile Apps Quickstart</td>
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</tr>
<tr>
<td>Mobile Engagement</td>
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<tr>
<td>aMobile Mobile Acceleration -BYOL</td>
<td>aiScalper</td>
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<tr>
<td>Convertigo Mobility Platform</td>
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<td>aMobile Mobile Acceleration -HOURLY</td>
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<tr>
<td>Good Enterprise Mobility Server</td>
<td>BlackBerry</td>
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<tr>
<td>ManageEngine Mobile Device Manager Plus</td>
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<tr>
<td>Keyhub</td>
<td>iQuest</td>
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</tr>
</tbody>
</table>

Related to your search:
- Notification Hub
- BES12 v12.4 Base Image
1. Connect a database
   - You already have a data connection
   - SQLite enabled, not recommended for production use. Click here to create a SQL Azure data connection.

2. Create a table API
   - To store data in your backend, you need a table. Pick a backend language below and create a TodoItem table API.
     - Backend language: C#
     - Download
     - Once you've downloaded your personalized server project, extract it and open in Visual Studio. Right-click the project and select "Publish" to host the code in your mobile backend. The TodoItem table will be created automatically using Entity Framework.

3. Configure your client application
   - CREATE A NEW APP
   - CONNECT AN EXISTING APP
1. Connect a database
   - You already have a data connection
   - SQLite enabled, not recommended for production use. Click here to create a SQL Azure data connection.

2. Create a table API
   - To store data in your backend, you need a table. Pick a backend language below and create a TodoItem table API.
     - Backend language:
       - Node.js
     - I acknowledge that this will overwrite all site contents.
     - Create TodoItem table
   - To create additional tables later, navigate to the 'Easy Tables' settings.
2. Create a table API

To store data in your backend, you need a table. Pick a backend language below and create a TodoItem table API.

Backend language:

C#  

Download

Once you’ve downloaded your personalized server project, extract it and open in Visual Studio. Right-click the project and select “Publish” to host the code in your mobile backend. The TodoItem table will be created automatically using Entity Framework.

3. Configure your client application

CREATE A NEW APP  CONNECT AN EXISTING APP

On a Windows PC: Install Visual Studio Community 2015

Download your personalized Universal Windows Platform project, extract it, and then open it in Visual Studio. The app is pre-configured to work with your hosted mobile backend.

Download
App Service
Host your web and mobile applications, REST APIs, and more in Azure

Subscription
Azure Pass

View
Resource Group

Search

![App Service Panel](image-url)
using Microsoft.WindowsAzure.MobileServices;

namespace ArduinoMatcha
{

    public static class MobileServiceClient
    {
        public static MobileServiceClient MobileService = new MobileServiceClient("https://arduinomatcha.azurewebsites.net");
    }

    public class App : Application
    {
        public static class
        {
        }
    }

    partial class App : Application
    {
        public static class
        {
        }
    }

    public partial class
    {
    }

    partial class
    {
    }
}
Try Mobile Apps

1. **Insert a Todo Item**
   Enter some text below and click Save to insert a new todo item into your database

2. **Query and Update Data**
   Click refresh below to load the unfinished Todo items from your hosted service
Try Mobile Apps

1. **Insert a Todo Item**
Enter some text below and click Save to insert a new todo item into your database.

2. **Query and Update Data**
Click refresh below to load the unfinished Todos from your hosted service.

- Kitkat
API Apps Tutorial

# HTTP Protocol

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Safe</th>
<th>Idempotent</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>Requests a specific representation of a resource</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PUT</td>
<td>Create or update a resource with the supplied representation</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>DELETE</td>
<td>Deletes the specified resource</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>POST</td>
<td>Submits data to be processed by the identified resource</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>HEAD</td>
<td>Similar to GET but only retrieves headers and not the body</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>OPTIONS</td>
<td>Returns the methods supported by the identified resource</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Microsoft Azure API Apps provide a rich platform for hosting REST APIs, as well as an API Marketplace in which you can publish your APIs so customers can find them and easily consume them from their own mobile, web, or desktop apps, or used as dependencies in their own API Apps. Learn more

Add folders and core references for:

- [ ] Web Forms
- [ ] MVC
- [x] Web API

- [ ] Add unit tests

Test project name: WebApplication4.Tests
In the ToDoListDataAPI project in **Solution Explorer**, open the App_Start\SwaggerConfig.cs file, then scroll down to line 174 and uncomment the following code.

```csharp
/*
 }
 .EnableSwaggerUi(c =>
 {
 */
```

The *SwaggerConfig.cs* file is created when you install the Swashbuckle package in a project. The file provides a number of ways to configure Swashbuckle.

The code you’ve uncommented enables the Swagger UI that you use in the following steps. When you create a Web API project by using the API app project template, this code is commented out by default as a security measure.

Run the project again.

In your browser address bar, add `swagger` to the end of the line, and then press Return.

(The URL is `http://localhost:45914/swagger`.)
Create App Service
Host your web and mobile applications. REST APIs, and more in Azure

API App Name
WebApplication420170506021534

Subscription
AzurePass

Resource Group
AzureArduino (southcentralus)

App Service Plan
ServicePlan7a298d-b1e7 (S1, South Central US)

Clicking the Create button will create the following Azure resources
Explore additional Azure services
App Service - WebApplication420170506021534

If you have removed your spending limit or you are using Pay as You Go, there may be monetary impact if you provision additional resources. Learn More
Your App Service app has been created.

Go to your app's **Quick Start** guide in the Azure portal to get started or read our deployment documentation.

---

**Deep Dive into Azure App Service: A Platform to Build Modern Applications**

By Cory Fowler, Sunitha Muthukrishna, Yochay Kriaty, Apurva Joshi, Byron Tarzil, Nazim Lala, Christina Compy, Christopher Anderson

Want to get hands-on with the Azure App Service team? Check out this video for detailed demos on the service’s tools and features, along with helpful tips from experts who walk you through how to build and deploy your apps on Azure App Service. See easy deployment options that streamline your DevOps cycles, and learn to manage and configure your services. Dive into monitoring and troubleshooting tools that are at your fingertips. Need to scale your apps to meet traffic demand? Learn that, too. Plus, discover Azure Functions and hear how serverless is taking over. From using basic FTP as a deployment source to using a Git repository for continuous deployment scenarios, get the practical guidance you need. Explore staged publishing, along ...

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**Start lesson**
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<td>Microsoft</td>
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<tr>
<td>API management (preview)</td>
<td>Microsoft</td>
<td>Web + Mobile</td>
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<tr>
<td>Cognitive Services APIs (preview)</td>
<td>Microsoft</td>
<td>Intelligence + analytics</td>
</tr>
<tr>
<td>API Connection (preview)</td>
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</tr>
<tr>
<td>Bing Maps API for Enterprise</td>
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<tr>
<td>API App Test Bench (preview)</td>
<td>Microsoft</td>
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<tr>
<td>Appcelerator Arrow API Builder</td>
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<td>CipherPoint Eclipse Data Security API</td>
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<td>Cloud service</td>
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<td>Customer Insights (preview)</td>
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<tr>
<td>SlashDB Unlimited</td>
<td>vt.enterprise</td>
<td>Compute</td>
</tr>
<tr>
<td>DreamFactory</td>
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</tr>
<tr>
<td>SlashDB Cloud Edition</td>
<td>vt.enterprise</td>
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</tr>
<tr>
<td>STRATO Blockchain Individual Instance</td>
<td>BlockApps</td>
<td>Compute</td>
</tr>
</tbody>
</table>

Turnkey solution for publishing APIs to external and internal environments and modern API gateways for existing backend services. Provide API documentation and an interactive console. Throttle, rate limit and quota your APIs. Monitor health of your APIs and quickly identify errors. Bring modern formats like JSON and REST to existing non-API services. Connect to APIs hosted anywhere on the Internet. Gain analytic insights on how your APIs are being used. Manage your service via the Azure portal, REST API, and command line.

**PUBLISHER**

Microsoft

**USEFUL LINKS**

- Service Overview
- Getting Started
- Videos
- Documentation
1. Create your first API

Create a new API in the Azure portal and follow the steps to define your API. You can manually define your API operation by operation instead.

2. Make an API call from the Developer portal

Make an API call from the Developer portal. The Developer portal is the public-facing experience containing API documentation and the ability for developers to subscribe and get credentials for making calls.

3. Review analytics

Review analytics by checking the usage and health via the Analytics tab on the publisher portal.

4. Learn more

There are many more features that Azure API Management service provides. Here are some links to get you started:

- Get started with API Management
- Customizing the developer portal
- Full documentation
Import API

From clipboard
From file
From URL

Specification document URL
http://calcapi.cloudapp.net/calcapi.json

Specification format
- WADL
- Swagger
- WSDL

New API  Existing API

Web API URL suffix

Web API URL scheme
- HTTP
- HTTPS

This is what the URL is going to look like:

https://arduinomatchamanagement.azure-api.net

Products (optional)

Add this API to one or more existing products.

Save  Cancel
Users

Current  Pending verification

ADD USER  INVITE USER

SELECT ALL  ADD TO GROUP  REMOVE FROM GROUP

Administrator
arduinomaster2@gmail.com  via Azure
Administrators  Developers  active

Nitsan Pri Hasah
pnitsan@gmail.com  via Basic auth
Developers  active
Administrator

This developer account is in **active** state and can be used to access all of the APIs it has subscriptions for.

**Identity provider**: Azure  
**User name**: Administrator  
**Email**: arduinomaster2@gmail.com  
**Registered since**: 11/17/2016

Subscriptions

**ADD SUBSCRIPTION**

<table>
<thead>
<tr>
<th>Subscription</th>
<th>Product</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter (default)</td>
<td>Starter</td>
<td>Active</td>
</tr>
<tr>
<td>Unlimited (default)</td>
<td>Unlimited</td>
<td>Active</td>
</tr>
</tbody>
</table>

Subscription requests

No results found.
APIs - Basic Calculator

Summary  Settings  Operations  Security  Issues  Products

ADD API TO PRODUCTS

No results found.
Add API to product

- Starter
- Unlimited

Save Cancel
1. Create your first API

Open the publisher portal and click ‘Import API’ from the dashboard. Use the link to the Calculator API Swagger definition below to create an example API. If you would prefer, you can manually define your API operation by operation instead.

Publisher portal
Calculator API Swagger definition

2. Make an API call from the Developer portal

The developer portal is the public-facing experience containing API documentation and the ability for developers to subscribe and get credentials for making calls. The built-in console allows you to make your first call without writing a single line of code.

Developer portal
APIs in developer portal

3. Review analytics

Once you have an API up and running you can check its usage and health via the Analytics tab on the publisher portal.

Publisher portal

4. Learn more

There are many more features that Azure API Management service provides you, here are some links to get you started:

Get started with API Management
Customizing the developer portal
Full documentation
APIs

**Basic Calculator**
Arithmetics is just a call away!

**Echo API**
**Basic Calculator**

Arithmetics is just a call away!

**Add two integers**

Produces a sum of two numbers.

**Try it**

**Request URL**

https://arduinomatchamanagement.azure-api.net/add?a=(a)&b=(b)

**Request parameters**

- **a**
  - First operand. Default value is 51.

- **b**
  - Second operand. Default value is 49.

**Request headers**

- **Ocp-Apim-Subscription-Key**
  - string
  - Subscription key which provides access to this API. Found in your Profile.

**Request body**

**Code samples**

<table>
<thead>
<tr>
<th>Curl</th>
<th>C#</th>
<th>Java</th>
<th>JavaScript</th>
<th>ObjC</th>
<th>PHP</th>
<th>Python</th>
<th>Ruby</th>
</tr>
</thead>
</table>
Basic Calculator

Add two integers

Produces a sum of two numbers.

Query parameters

a

51

b

49

Add parameter

Headers

Ocp-Apim-Trace

true

Remove header

Ocp-Apim-Subscription-Key

....................

Add header

Authorization

Subscription key

Primary-ec7f...

Request URL

https://arduinomatchamangement.azure-api.net/add?a=51&b=49
Subscription key: Primary-ec7f...

Request URL:
https://arduinomatchmanagement.azure-api.net/add?a=51&b=49

HTTP request:
GET https://arduinomatchmanagement.azure-api.net/add?a=51&b=49 HTTP/1.1
Host: arduinomatchmanagement.azure-api.net
Ocp-Apim-Trace: true
Ocp-Apim-Subscription-Key: ***********************

Send

Response status:
200 OK

Response latency:
47 ms

Response content:
Pragma: no-cache
Ocp-Apim-Trace-Location: https://apimgtsttkiesyrammk24s.blob.core.windows.net/apinspectorcontainer/EoLsrG0u1Ps-mx3FrF-vkg2-457s2015-07-08sr-bblszg-wOJe1Y%2Bw106531h57%00%2BTmQaP50LY%2FesL5q1k8x6%3D&se=2016-11-18T15%3A32%3A52z&sp=r&tracerId=22059047edd14218829261e2976c6993
Date: Thu, 17 Nov 2016 15:32:58 GMT
X-AspNet-Version: 4.0.30319
Once you copied your code from the developer portal, you may experience an error with the `HttpUtility`. To handle it, you have to right click your project, then select ‘add’ and ‘reference’, then choose `System.Web` and Save.
Publishing

- Don’t forget to publish your service!!!
Other Features

File Storage

- https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-how-to-use-files

Blob Storage

- https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-how-to-use-blobs