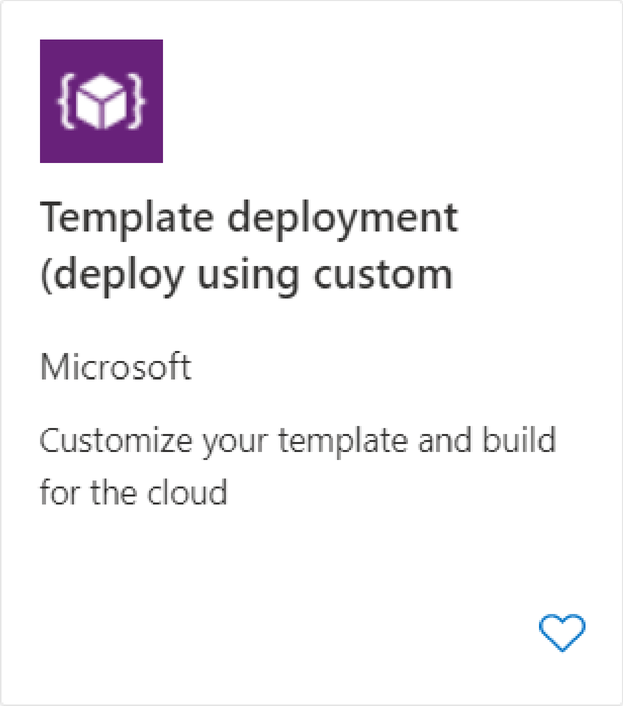
Appendix A: Environment Setup

The following steps will configure an environment to perform the guide's migration steps for the sample conference demo application.

Deploy the ARM template

- Open the Azure Portal
- Create a new resource group
- Select **+Add**, type **template**, select the **Template Deployment…**

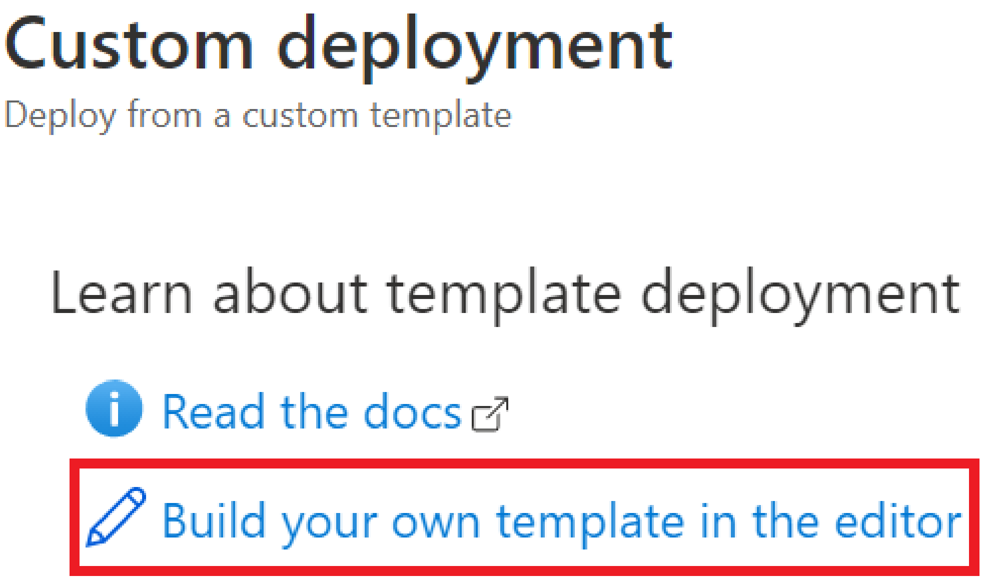


Template deployment (deploy using custom

Microsoft

Customize your template and build for the cloud

- Select **Create**
- Select **Build your own template in the editor**



Custom deployment

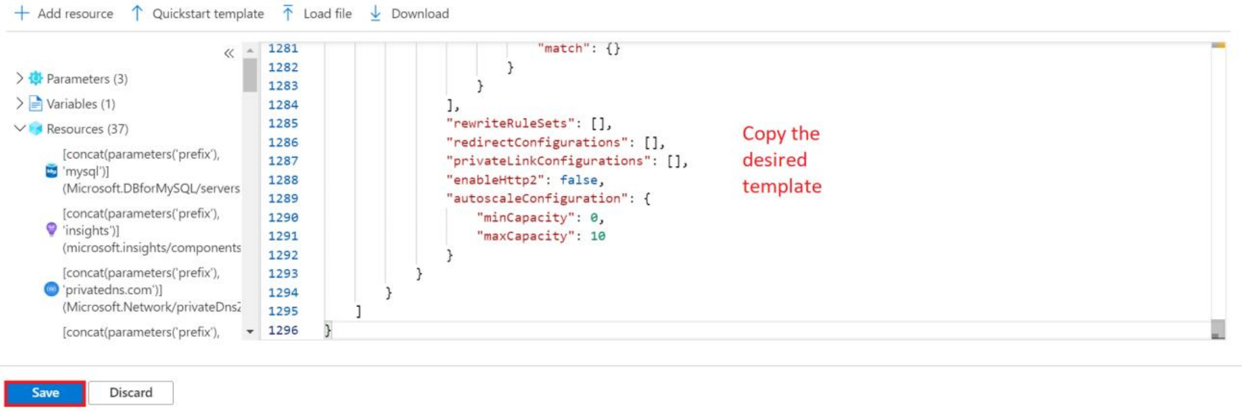
Deploy from a custom template

Learn about template deployment

- Choose between the `secure` or the `non-secure` ARM template. The difference between the two options is the secured option's resources are hidden behind an App Gateway with private endpoints, whereas the other is directly exposed to the internet.

- Copy the json into the window

- Select **Save**



Add resource
Quickstart template
Load file
Download
Parameters (3)
Variables (1)
Resources (37)
[concat(parameters('prefix'), 'mysql')] (Microsoft.DBforMySQL/servers
[concat(parameters('prefix'), 'insights')] (microsoft.insights/components
[concat(parameters('prefix'), 'privatedns.com')] (Microsoft.Network/privateDnsZ
[concat(parameters('prefix'),
Save
Discard

```
                        "match": {}
                    }
                }
            ],
            "rewriteRuleSets": [],
            "redirectConfigurations": [],
            "privateLinkConfigurations": [],
            "enableHttp2": false,
            "autoscaleConfiguration": {
                "minCapacity": 0,
                "maxCapacity": 10
            }
        }
    }
  ]
}
```

Copy the desired template

- Fill in the parameters

  – Be sure to record your prefix and password, they are needed later
- Select **Review + create**

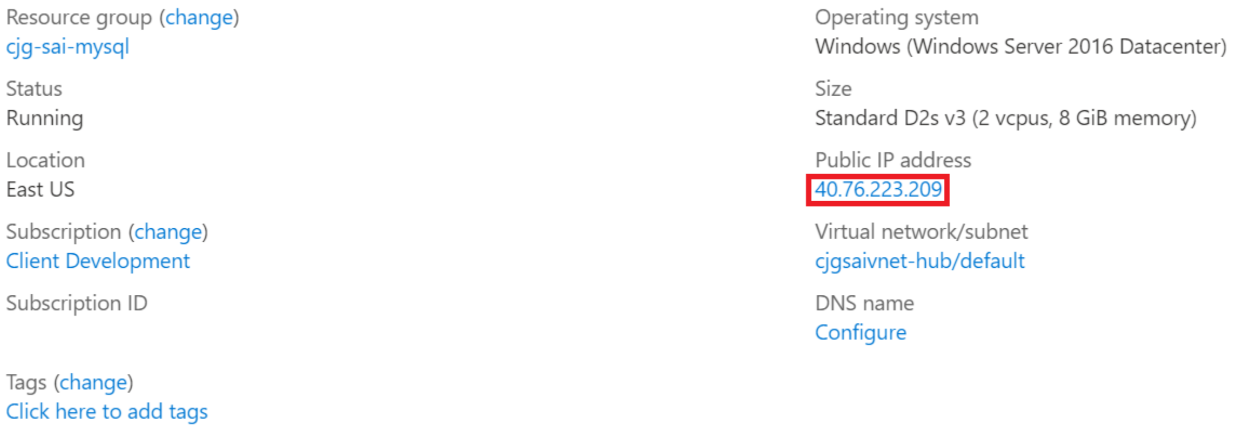
- Select the **I agree…** checkbox

- Select **Create**, after about 20 minutes the landing zone will be deployed

Install MySQL 5.5

- Login to the deployed Dev VM

  - Browse to the Azure Portal
  - Select the VM
  - Copy the **Public IP Address**



Resource group (change)
cjg-sai-mysql

Status
Running

Location
East US

Subscription (change)
Client Development

Subscription ID

Tags (change)
Click here to add tags

Operating system
Windows (Windows Server 2016 Datacenter)

Size
Standard D2s v3 (2 vcpus, 8 GiB memory)

Public IP address
40.76.223.209

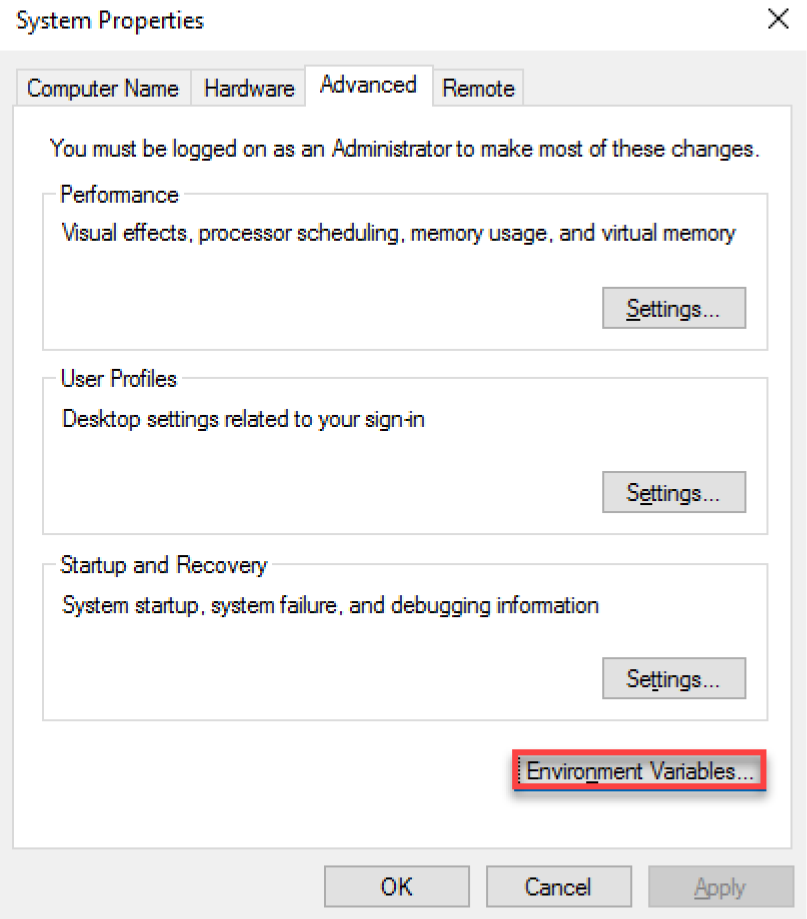
Virtual network/subnet
cjgsaivnet-hub/default

DNS name
Configure

  - Open Remote Desktop and connect to the VM IP Address.
  - Login using the username and password entered above.

- Download the following MySQL community versions
  - MySQL 5.5.x
  - MySQL 8.0.x
- Install MySQL 5.5
  - Select **Run.**
  - On the Welcome dialog, select **Next**.
  - Select **I accept...**, select **Next.**
  - On the Choose Setup Type dialog, select **Complete**, select **Next.**
  - Select **Install.**
  - When complete, select **Finish.**
  - The configuration wizard will start, select **Next.**
  - Select **Detailed Configuration,** then select **Next.**
  - Select **Server Machine**, select **Next.**
  - Select **Multifunctional database**, select **Next**
  - On the **InnoDB Tablespace Settings**, select **Next**
  - Select **Online Transaction Processing (OLTP)**, select **Next**
  - On the networking options, select **Next**
  - For the character set, select **Next**
  - On the windows service, select **Next**
  - Enter the root password, select the **Enable root access from remote machines**, select **Next**
  - Select **Execute**
  - Select **Finish**

- Add the **C:FilesServer 5.5* path to the PATH environment variable
  - Open Windows Explorer
  - Right-click **This PC**, select **Properties** and then **Advanced system settings**
  - Select **Environment Variables**



System Properties

You must be logged on as an Administrator to make most of these changes.

Performance

Visual effects, processor scheduling, memory usage, and virtual memory

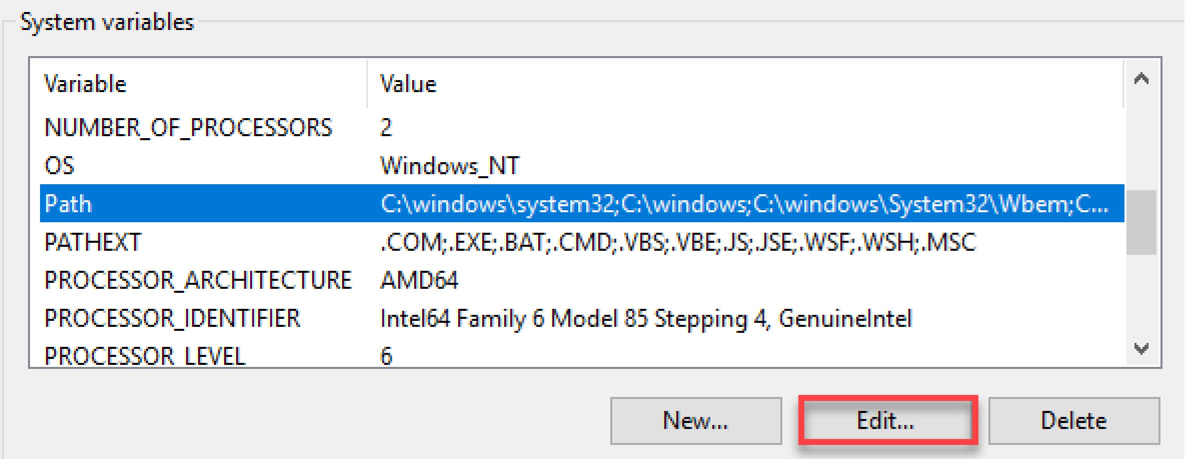
User Profiles

Desktop settings related to your sign-in

Startup and Recovery

System startup, system failure, and debugging information

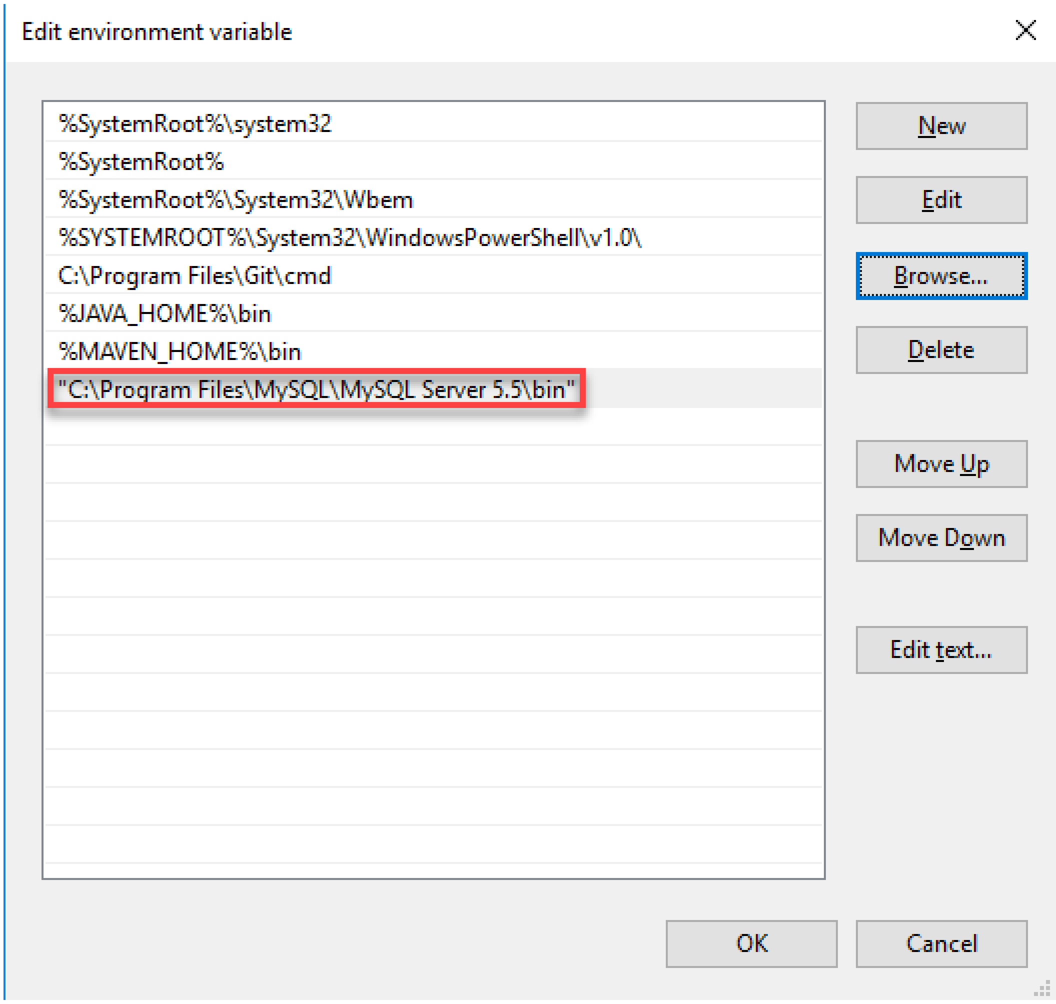
  - Under **System variables**, choose **Path**. Then, select **Edit...**



System variables

Variable	Value
NUMBER_OF_PROCESSORS	2
OS	Windows_NT
Path	C:\windows\system32;C:\windows;C:\windows\System32\Wbem;C...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE	AMD64
PROCESSOR_IDENTIFIER	Intel64 Family 6 Model 85 Stepping 4, GenuineIntel
PROCESSOR_LEVEL	6

- In the **Edit environment variable** dialog, select **New** and then **Browse…** Browse to `C:\Program Files\MySQL\MySQL Server 5.5\bin`.



%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
C:\Program Files\Git\cmd
%JAVA_HOME%\bin
%MAVEN_HOME%\bin
"C:\Program Files\MySQL\MySQL Server 5.5\bin"

- Select **OK.**

Install MySQL Workbench

- Download the MySQL Workbench installer
- Install Visual C++ Redistributable for Visual Studio 2015, 2017, and 2019 from here. Make sure to select the x64 installer. Run the installer, accept the software's license terms, and close the installer.
- Install MySQL Workbench
  - Start the installer, select **Run.**
  - Select **Next**
  - Select **Next**
  - Select **Install**
  - Select **Finish**

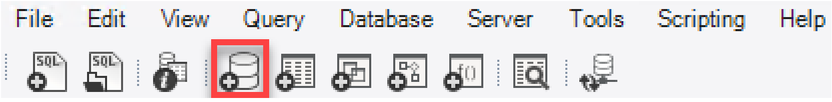
Download artifacts

- Download and Install Git
  - Download and run the 64-bit installer
  - Click **Next** through all prompts
- Open a Windows PowerShell window (just by entering "PowerShell" into the Start menu) and run the following commands

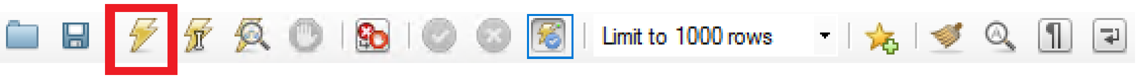
```
mkdir c:\mysqlguide
cd c:\mysqlguide
git clone https://github.com/solliancenet/onprem-mysql-to-azuremysql-migration-guide
```

Deploy the Database

- Open SQL Workbench
- Connect to your local MySQL instance (just select **Local instance MySQL** on the Welcome page)
- If prompted, select **Continue anyway**
- Create a new schema called **reg_app**
  - Select the **Create schema** button

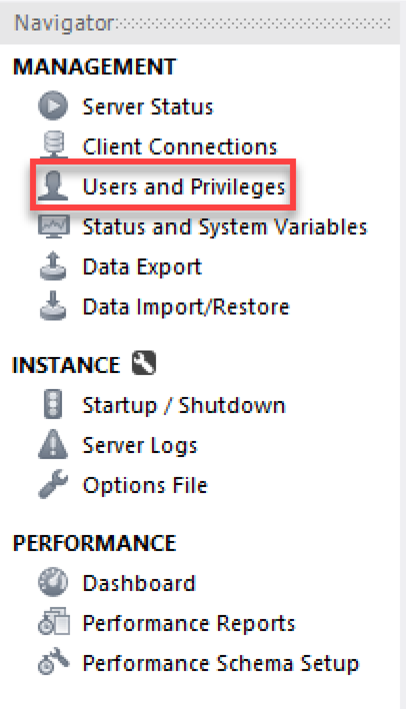


  - For the name, type **reg_app**
  - Select **Apply**
  - In the dialog, select **Apply**
  - Select **Finish**
- Select **File->Open SQL Script**
- Browse to **C:\mysql-to-azuremysql-migration-guide-scripts**
- Select **conferencedemo-mysql** file, select **Open.**
- In the navigator, select the Schemas tab, double-click the **reg_app** schema.
- Select **Execute** in the query editor

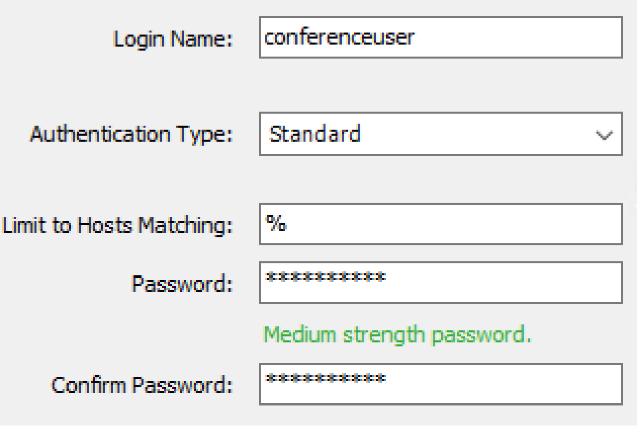


- Create the database user
  - In the navigator, select the Administration tab.

- Select **Users and Privileges**



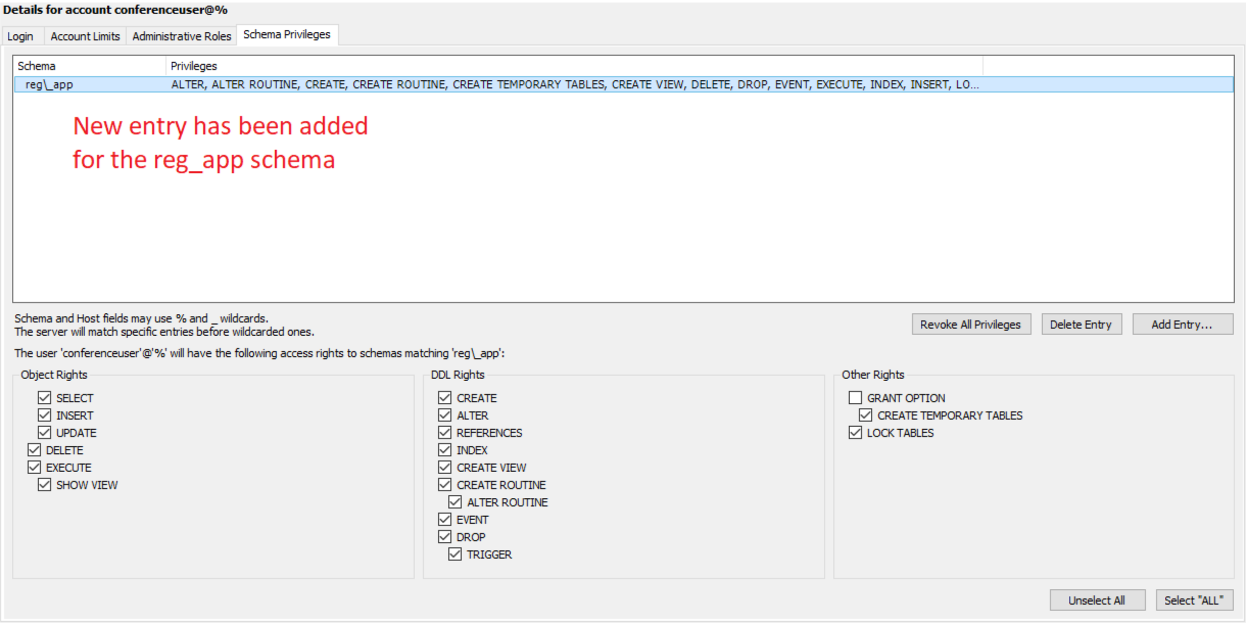
- Select **Add Account**
- For the name, type **conferenceuser**
- For the password, type a password



Login Name:	conferenceuser
Authentication Type:	Standard
Limit to Hosts Matching:	%
Password:	***********
	Medium strength password.
Confirm Password:	***********

- Select **Apply**
- Select the **Schema Privileges** tab
- Select **Add Entry**
- Select the **reg_app** schema, then select **OK**
- Select **Select ALL**

- Select **Apply.** View the following image to ensure it is configured correctly.



Details for account conferenceuser@%

Schema	Privileges
reg_app	ALTER, ALTER ROUTINE, CREATE, CREATE ROUTINE, CREATE TEMPORARY TABLES, CREATE VIEW, DELETE, DROP, EVENT, EXECUTE, INDEX, INSERT, LO...

New entry has been added for the reg_app schema

Schema and Host fields may use % and _ wildcards.
The server will match specific entries before wildcarded ones.

The user 'conferenceuser'@'%' will have the following access rights to schemas matching 'reg_app':

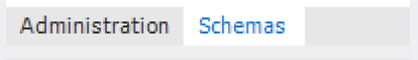
Object Rights
- ☑ SELECT
- ☑ INSERT
- ☑ UPDATE
- ☑ DELETE
- ☑ EXECUTE
- ☑ SHOW VIEW

DDL Rights
- ☑ CREATE
- ☑ ALTER
- ☑ REFERENCES
- ☑ INDEX
- ☑ CREATE VIEW
- ☑ CREATE ROUTINE
- ☑ ALTER ROUTINE
- ☑ EVENT
- ☑ DROP
- ☑ TRIGGER

Other Rights
- ☐ GRANT OPTION
- ☑ CREATE TEMPORARY TABLES
- ☑ LOCK TABLES

Configure Blob Data

- Navigate to the **Schemas** tab under the **Navigator** window

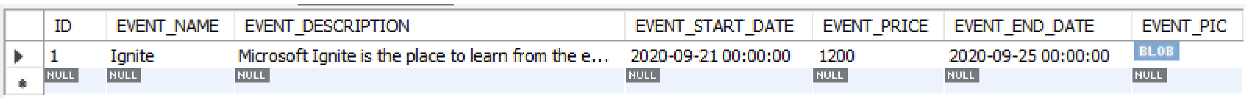


- If the **reg_app** schema does not appear, then right-click anywhere within the pane and select **Refresh All**

- Expand **reg_app > Tables.** Hover over the **speakers** table. Select the third button which appears. The **Result Grid** will show every record in the table

- For every record, change the value of the **SPEAKER_PIC** field
  - Right-click each NULL entry and select **Load Value From File...**
  - Select **C:\mysql-to-azuremysql-migration-guide-scripts-images-bio-pic1.png**
  - Select **Open**
- Select **Apply** at the bottom right-hand corner of the page, and **Apply** again to confirm the query

- Repeat this process for the **EVENT_PIC** field of the **events** table
  - This time, load **C:-mysql-to-azuremysql-migration-guide-scripts-images-pic0.png** (or **event-pic1.png**)
  - The image below shows BLOB data successfully loaded for the **events** table



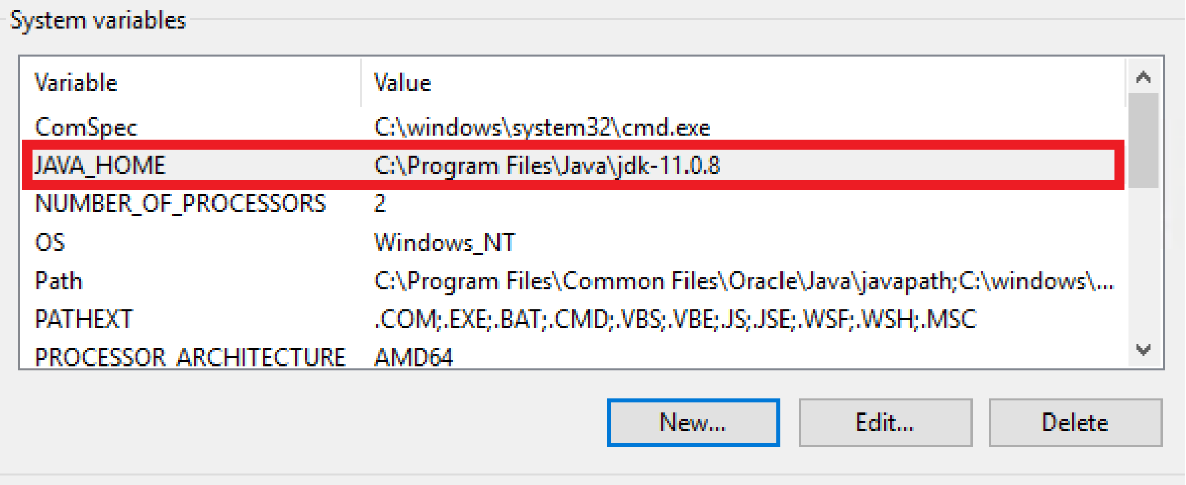
	ID	EVENT_NAME	EVENT_DESCRIPTION	EVENT_START_DATE	EVENT_PRICE	EVENT_END_DATE	EVENT_PIC
▶	1	Ignite	Microsoft Ignite is the place to learn from the e...	2020-09-21 00:00:00	1200	2020-09-25 00:00:00	BLOB
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Setup Java and Maven

- Download and Install Java Development Kit 11.0

  Note: Be sure to check what the highest SDK/JRE that is supported in Azure App Service before downloading the latest.

- Set the JAVA_HOME environment variable to the **C:\Files-{version}** folder
  - Open the **Environment Variables** dialog box again (refer here for more details)
  - Select **New** under **System variables**
  - Type **JAVA_HOME**
  - Copy the path shown below, then select **OK.** The image below shows the correct configuration for the **JAVA_HOME** environment variable.



System variables

Variable	Value
ComSpec	C:\windows\system32\cmd.exe
JAVA_HOME	C:\Program Files\Java\jdk-11.0.8
NUMBER_OF_PROCESSORS	2
OS	Windows_NT
Path	C:\Program Files\Common Files\Oracle\Java\javapath;C:\windows\...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE	AMD64

- Download and install the Java Runtime
- Download and configure Maven
  - Download the zip archive
  - From the download location, right-click the zip archive and select **Extract All...**
  - Set the destination to **C:Files**. Then, select **Extract**
  - Set the M2_HOME environment variable to the **C:Files-maven-{version}** folder
  - Add the **C:\Files-maven-3.6.3** path to the PATH environment variable

Install Azure CLI

- Download and Install the Azure CLI

Install NodeJS

- Download and Install NodeJS. Select the LTS 64-bit MSI Installer.
  - Accept the default installation location

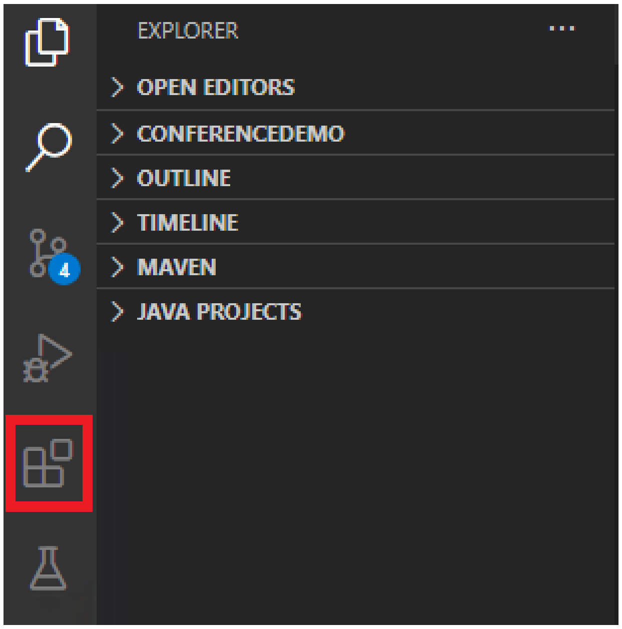
  - Make sure that the **Automatically install the necessary tools** box is not selected

Install and Configure Visual Studio Code

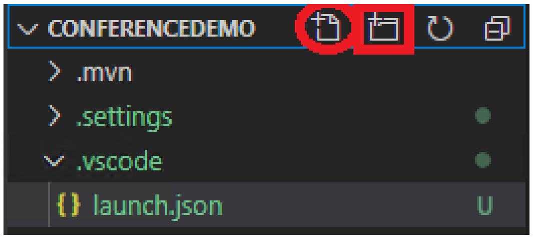
- Download and Install Visual Studio Code. Select the 64-bit Windows User Installer

Configure the Web Application API

- Open Visual Studio Code
- Open the **C:\mysql-to-azuremysql-migration-guide* folder (Ctrl+K and Ctrl+O, or** File->Open Folder...**)
- Select the **Extensions** tab



- Search for and install the following extensions
  - Java Extension Pack
  - Spring Initializer Java Support
- When prompted, select **Yes** to trust the **Maven Wrapper**
- Update the `.vscode\launch.json` file
  - If a launch.json does not exist, create a `.vscode` folder, and then create a new file called `launch.json`. The rectangle highlights the tool used to create a new folder, while the oval indicates the tool to create a new file.



- Copy the following into it:

```
{
    // Use IntelliSense to learn about possible attributes.
    // Hover to view descriptions of existing attributes.
    // For more information, visit: https://go.microsoft.com/fwlink
/?linkid=830387
    "version": "0.2.0",
    "configurations": [
        {
            "type": "java",
            "name": "Debug (Launch)",
            "request": "launch",
            "mainClass": "com.yourcompany.conferencedemo.Conference
demoApplication",
            "env" :{
                "DB_CONNECTION_URL" : "jdbc:mysql://localhost:3306/
reg_app?useUnicode=true&useJDBCCompliantTimezoneShift=true&useLegac
yDatetimeCode=false&serverTimezone=UTC&noAccessToProcedureBodies=tr
ue",
                "DB_USER_NAME" : "conferenceuser",
                "DB_PASSWORD" : "Seattle123",
                "ALLOWED_ORIGINS" : "*",
            }
        }
    ]
}
```

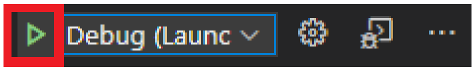
- Update the **{DB_CONNECTION_URL}** environment variable to the MySQL Connections string `jdbc:mysql://localhost:3306/reg_app?useUnicode=true&useJDBCCompliantTimezoneShift=true&useLegacyDatetimeCode=false&serverTimezone=UTC&noAccessToProcedureBodies=true`

- Update the **{DB_USER_NAME}** environment variable to the MySQL Connections string `conferenceuser`

- Update the **{DB_PASSWORD}** environment variable to the MySQL Connections string `Seattle123`

- Update the **{ALLOWED_ORIGINS}** environment variable to *

- Select the **Debug** tab (directly above the **Extensions** tab from earlier), then select the debug option to start a debug session



- If prompted, select **Yes** to switch to `standard` mode

Test the Web Application

- Open a browser window, browse to **http://localhost:8888.**
- Ensure the application started on port 8888 and displays results.

Configure the Web Application Client

- Open a new Visual Studio Code window to **C:\mysql-to-azuremysql-migration-guide-client**
- Open a terminal window (**Terminal**->**New Terminal**).
- Run the following commands in the terminal window to install all the needed packages, if prompted, select **N**

```
$env:Path = [System.Environment]::GetEnvironmentVariable("Path","Machine")

npm install
npm install -g @angular/cli
```

Note: If PowerShell indicates that npm is not a recognized command, try restarting VS Code.

- Run the following commands to run the client application.

```
npm start
```

- Open a browser to the node site **http://localhost:{port}.**
- Browse the conference site, ensure sessions and speaker pages load.

Deploy the Java Server Application to Azure

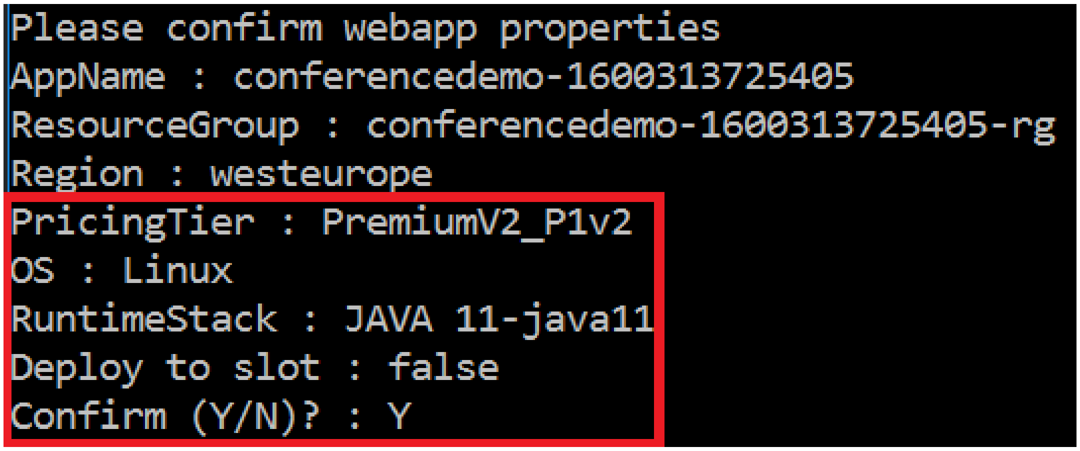
- Open a command prompt window.
- Run the following command to create the Maven configuration to deploy the app. Multiple packages will be installed from the Maven repository.

```
cd C:\mysqlguide\onprem-mysql-to-azuremysql-migration-guide\artifacts\testapp
\conferencedemo
"C:\Program Files\apache-maven-3.6.3\bin\mvn" com.microsoft.azure:azure-webap
p-maven-plugin:1.9.1:config
```

- For the`Define value for OS(Default:Linux)`, select the option that corresponds to `linux` or press **ENTER**

- Select `Java 11`

- Type **Y** to confirm the settings, then press **ENTER**



```
Please confirm webapp properties
AppName : conferencedemo-1600313725405
ResourceGroup : conferencedemo-1600313725405-rg
Region : westeurope
PricingTier : PremiumV2_P1v2
OS : Linux
RuntimeStack : JAVA 11-java11
Deploy to slot : false
Confirm (Y/N)? : Y
```

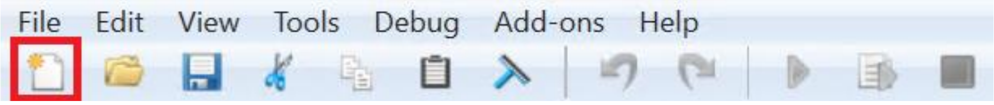
- Switch to Visual Studio and the **ConferenceDemo** project.
- Switch to the `pom.xml` file, notice the **com.microsoft.azure** groupId is now added
- Modify the resource group, appName and region to match the ones deployed in the ARM template
- If there is more than one subscription, set the specific `subscriptionId` in the maven configuration
- If the `secure` landing zone has been deployed, set the hosts file
  - Browse to your resource group, select the **PREFIXapi01** app service
  - Select **Networking**
  - Select **Configure your Private Endpoint connections**
  - Select the **PREFIXapi-pe** private endpoint.
  - Record the private IP Address.
  - Repeat for the **PREFIXapp01** app service
  - Open a Windows PowerShell ISE window.
  - Copy in the code from below, be sure to replace tokens, and save to **C:\mysqlguide\onprem-mysql-to-azuremysql-migration-guide\artifacts** as **ConfiguringHostsFile.ps1**.

```
$prefix = "{PREFIX}";
$apiip = "{APIIP}";
$app_name = "$($prefix)api01";

$hostname = "$app_name.azurewebsites.net"
$line = "$apiip`t$hostname"
add-content "c:\windows\system32\drivers\etc\hosts" $line

$hostname = "$app_name.scm.azurewebsites.net"
$line = "$apiip`t$hostname"
add-content "c:\windows\system32\drivers\etc\hosts" $line
```

```
    $appip = "{APPIP}"
    $app_name = "$($prefix)app01";
    $hostname = "$app_name.azurewebsites.net"
    $line = "$appip`t$hostname"
    add-content "c:\windows\system32\drivers\etc\hosts" $line

    $hostname = "$app_name.scm.azurewebsites.net"
    $line = "$appip`t$hostname"
    add-content "c:\windows\system32\drivers\etc\hosts" $line
```

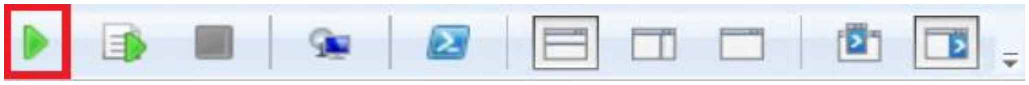
  - To run the PowerShell script, open the PowerShell ISE

  - Create a new file



  - Copy in the code from above and save to **C:-mysql-to-azuremysql-migration-guide* as** ConfiguringHostsFile.ps1**

  - Run the file



- In the command prompt window from earlier, run the following to deploy the application.

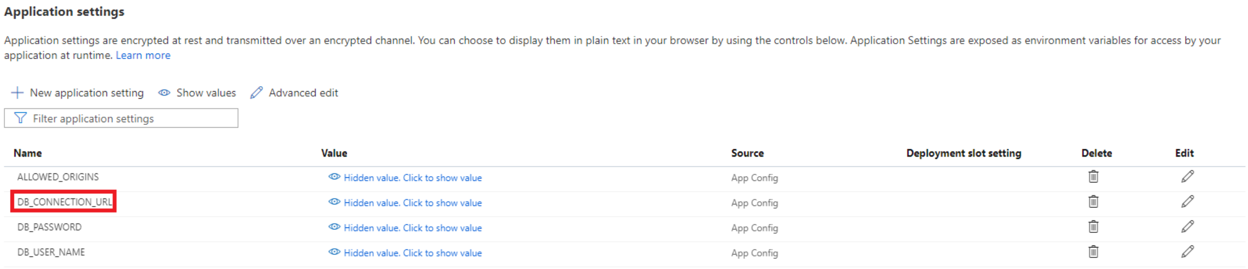
- When prompted, login to the Azure Portal.

```
C:\Program Files\apache-maven-3.6.3\bin\mvn" package azure-webapp:deploy
```

- Update the App Service configuration variables by running the following, be sure to replace the tokens:

```
$prefix = "{PREFIX}";
$app_name = "$($prefix)api01";
$rgName = "{RESOURCE-GROUP-NAME}";
az login
az account set --subscription "{SUBSCRIPTION-ID}"
az webapp config appsettings set -g $rgName -n $app_name --settings DB_CONNEC
TION_URL={DB_CONNECTION_URL}
az webapp config appsettings set -g $rgName -n $app_name --settings DB_USER_N
AME={DB_USER_NAME}
az webapp config appsettings set -g $rgName -n $app_name --settings DB_PASSWO
RD={DB_PASSWORD}
az webapp config appsettings set -g $rgName -n $app_name --settings ALLOWED_O
RIGINS=*
```

- **Note:** You will need to escape the ampersands in the connection string. You may consider inputting the value through Azure Portal as well. Navigate to the API App Service, and select **Configuration** under **Settings**. Then, under **Application settings**, manually enter the value.



Application settings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display them in plain text in your browser by using the controls below. Application Settings are exposed as environment variables for access by your application at runtime. Learn more

Name	Value	Source	Deployment slot setting	Delete	Edit
ALLOWED_ORIGINS	Hidden value. Click to show value	App Config		🗑	✎
DB_CONNECTION_URL	Hidden value. Click to show value	App Config		🗑	✎
DB_PASSWORD	Hidden value. Click to show value	App Config		🗑	✎
DB_USER_NAME	Hidden value. Click to show value	App Config		🗑	✎

- Restart the Java API App Service by running the following.

```
az webapp restart -g $rgName -n $app_name
```

Deploy the Angular Web Application to Azure

- Switch to the Visual Studio Code window for the Angular app (Conferencedemo-client)
- Navigate to **src.prod.ts**.
- Set **webApiUrl** to **[JAVA APP SERVICE URL]/api/v1**

  Note: the App service url will come from the App Gateway service blade if using the secure deployment, or the App Service blade if not using the secure deployment.

- Run the following command to package the client app:

```
ng build --prod
```

- Run the following commands in the Visual Code terminal window or a new PowerShell Window to zip and publish the client application, be sure to replace the tokens:

```
cd C:\mysqlguide\onprem-mysql-to-azuremysql-migration-guide\artifacts\testapp
\conferencedemo-client\dist
Compress-Archive -Path "./conference-client/*" -DestinationPath "./confClient
.zip"
$prefix = "{PREFIX}";
$app_name = "$($prefix)app01";
$rgName = "{RESOURCE-GROUP-NAME}";
$subscription = "{SUBSCRIPTION-NAME}";

az login

az account set --subscription "{SUBSCRIPTION-ID}"

az webapp stop --name $app_name --resource-group $rgName --subscription $subs
cription
az webapp deployment source config-zip --resource-group $rgName --name $app_n
```

```
ame --src "./confClient.zip" --subscription $subscription
az webapp start --name $app_name --resource-group $rgName --subscription $sub
scription
```

Configure Network Security (Secure path)

- When attempting to connect to the database from the app service, an access denied message should be displayed. Add the app virtual network to the firewall of the Azure Database for MySQL
  - Browse to the Azure Portal
  - Select the target resource group
  - Select the `{PREFIX}mysql` resource
  - Select **Connection security**
  - Select the `Allow access to all Azure Services` toggle to `Yes`
  - Select **Save**