

Week	Date	Teaching	Attended
		Azure Cloud	

Aim: The aim of this lab is to investigate the creation of a range of Cloud-based services within the Microsoft Azure Cloud

Time to complete:

4 hours (Two supervised hours in the lab, and two additional hours, unsupervised).

Activities:

Learning activities:

At the end of these activities, you should understand:

- How to setup cloud-based services.
- Create cloud-based infrastructures, and link to them.
- Create a cloud-based data infrastructure.

Reflective statements (end-of-exercise):

What are the key strengths of the Azure Cloud as opposed to other Cloud infrastructures?

What are the access permissions on TCP ports by default?

How are ports opened up, and how can then be locked-down?

Microsoft Azure

Prof. Bill Buchanan, Rich Macfarlane

1 Details

Aim: The aim of this lab to setup an Azure Cloud infrastructure, and develop a deeper understanding of cloud-based services, with a special focus on the security setup.

2 Create Cloud-based Web Service

Demo: <http://youtu.be/I4S8M0LgSwk>

First login with your Azure Account, and do the following:

- Create a Web site named *matricno.azurewebsites.net*.
- From the Dashboard, determine your FTP details for FTP User and FTP Hostname.
- Start-up Visual Studio, and add an **ASP.NET Web Application**. Note that the home file is named **Default.aspx**. Create your own home page (by modifying the HTML in the aspx page).
- Using your FTP details, publish your site, and check that it works. Remember to publish to the site/wwwroot folder on your remote site.

3 Create Virtual Machine

Demo: <http://youtu.be/6WSw3qlwIc4>

Now we will do the same, but this time we will create a Virtual Machine to perform the same thing:

- Create a Virtual Machine using Window 2008 for *matricno.cloudapp.net*.
- Connect to your VM with Remote Desktop.
- In your VM, add a Role of Web Server (IIS).

Note that this part of the lab will take some time to setup, so go onto Part 4, and return once the IIS Role has been added.

- In your VM, add a Role Service of FTP.
- In your VM, setup the FTP firewall with the Public IP address of your site, and for the data ports of 7000-7002.
- In your VM, prove that FTP and HTTP are working locally (connect to localhost).
- On the Azure Management Page, add end points of 80, 20, 21, 7000, 7001, and 7002 to your Virtual Machine. Note that 7000, 7001 and 7002 will be used for the passive FTP ports.
- Start-up Visual Studio, and add an **ASP.NET Web Application**. Note that the home file is named **Default.aspx**. Create your own home page (by modifying the HTML in the aspx page).
- Using your FTP details, publish your site, and check that it works.

4 Create SQL Data Infrastructure

Demo: http://youtu.be/vuEsRM_kh7I

Now connect to the SQL Data infrastructure:

- On the Azure Management Page, add a New SQL database.
- On the Azure Management Page, select Manage allowed IP addresses, and add the range 0.0.0.0 to 255.255.255.255.
- On the Azure Management Page, go to Manage URL, to administer your database.
- On the Database Admin Page, create you database schema for the following:

Item	Description	Price
XT311	CISSP Certification	10
XG312	CCNA Security	22
OT821	CCNP ONT	33
XP411	CCNP Route	44

- On the Database Admin Page, next add the required rows to populate the database.
- Start-up Visual Studio, and add an **ASP.NET Web Application**. Note that the home file is named **Default.aspx**. Add the following code to the page:

```
<asp:Button ID="Button1" runat="server" Text="Button"
OnClick="Button1_Click" />
<asp:GridView ID="GridView1" runat="server" >
</asp:GridView>
```

- Next click on the Button and add the following in the code behind:

```
System.Data.SqlClient.SqlConnection _SqlConnection = new
System.Data.SqlClient.SqlConnection();
    _SqlConnection.ConnectionString = "PASTE HERE>>>>";

System.Data.SqlClient.SqlCommand _SqlCommand =
    new System.Data.SqlClient.SqlCommand("SELECT * FROM Table1", _SqlConnection);

    System.Data.SqlClient.SqlDataAdapter _SqlDataAdapter
        = new System.Data.SqlClient.SqlDataAdapter();
    _SqlDataAdapter.SelectCommand = _SqlCommand;

    DataTable _DataTable = new DataTable();
    _DataTable.Locale = System.Globalization.CultureInfo.InvariantCulture;
    _SqlDataAdapter.Fill(_DataTable);
    GridView1.DataSource = _DataTable;
    GridView1.DataBind();
```

- On the Azure Management Page, get your connection string, and paste it into the code given above.
- Run the page, and make sure it works.
- Create a Web Site, and upload your code to it, and make sure it works in the Cloud.
- Now add a new table to your database (Table2), with the following:

ID	FirstName	Surname	FullAddress	Test 1	Test 2	Gender	Age
1	Fred	Smith	10 Fake Street	10	20	M	30
2	Bert	Smith	1 Round Lane	30	40	M	40
3	Bob	Malcolm	5 Square Road	100	30	M	22
4	Eve	Almond	11 Full Lane	45	40	F	56
5	Freddy	Smith	111 Edinburgh Road	50	50	M	43

- On the Azure Management Page, lock down your SQL connection, so that only your IP address is allowed to manage the database. Check this by accessing it on your host, and on another one.

5 Upload database

<http://youtu.be/FRV6eIEQC1c>

1. On Microsoft Azure create a new SQL database.
2. Next install **Microsoft SQL Server Migration Assistant for Access**, and run the 32-bit version.
3. Next import the following database into your Cloud-based infrastructure:

<http://billatnapier.com/db1.zip>

6 Integrating with database

Once successful, go back to Microsoft Azure, and use the Manage URL link to connect to your database, and run the command of (Figure 1):

```
select * from db1
```

One at a time, run the following SQL commands, and now how they operate (and any problems you have with them):

```
SELECT * FROM db1 ORDER BY Surname
SELECT * FROM db1 ORDER BY Surname DESC
SELECT * FROM db1 ORDER BY Age
SELECT * FROM db1 ORDER BY Gender
SELECT FirstName FROM db1 WHERE (Gender='M')
SELECT FirstName FROM db1 WHERE (Gender='F')
SELECT Surname FROM db1 WHERE (Gender='M')
SELECT Surname FROM db1 WHERE (Gender='F')
SELECT First(Surname) FROM db1 WHERE (Gender='M')
SELECT Last(Surname) FROM db1 WHERE (Gender='M')
```

```

SELECT Max(Age) FROM db1
SELECT Min(Age) FROM db1
SELECT FirstName FROM db1 WHERE (Surname='Smith' OR Surname='Almond')
SELECT Avg([Test 1]) FROM db1
SELECT Avg([Test 1]) FROM db1 WHERE (Age>30)
SELECT Sum([Test 1]) FROM db1
SELECT Sum([Test 1]) FROM db1 WHERE (Age>30)
SELECT Count(FirstName ) FROM db1 WHERE (Age<30)
SELECT Count(FirstName ) FROM db1 WHERE (Age>30)
SELECT Count(FirstName ) FROM db1 WHERE (Age=30)
SELECT FirstName,Surname FROM db1
SELECT DISTINCT Surname FROM db1
SELECT FirstName,Surname,Age,[Test 1] FROM db1 WHERE (Gender='M')
SELECT FirstName,Surname,[Test 1],[Test 2] FROM db1 WHERE (Gender<>'M')
SELECT FirstName,Surname,[Test 1],Age FROM db1 WHERE Age BETWEEN 10 AND 50
SELECT FirstName,Surname,[Test 1],Age FROM db1 WHERE Age IN (22,56,33)
SELECT FirstName,Surname,[Test 1],Age FROM db1 WHERE Surname LIKE 'Sm%'
SELECT FirstName,Surname,[Test 1],Age FROM db1 WHERE Surname LIKE '[AaSSuu]%'
SELECT FirstName,Surname,[Test 1],Age FROM db1 WHERE Surname NOT LIKE 'Sm%'
SELECT Gender,AVG([Test 1]) FROM db1 GROUP BY Gender
SELECT FirstName,Surname,[Test 1] from db1 where surname in ( 'Smith', 'Almond') ORDER BY
Surname

```

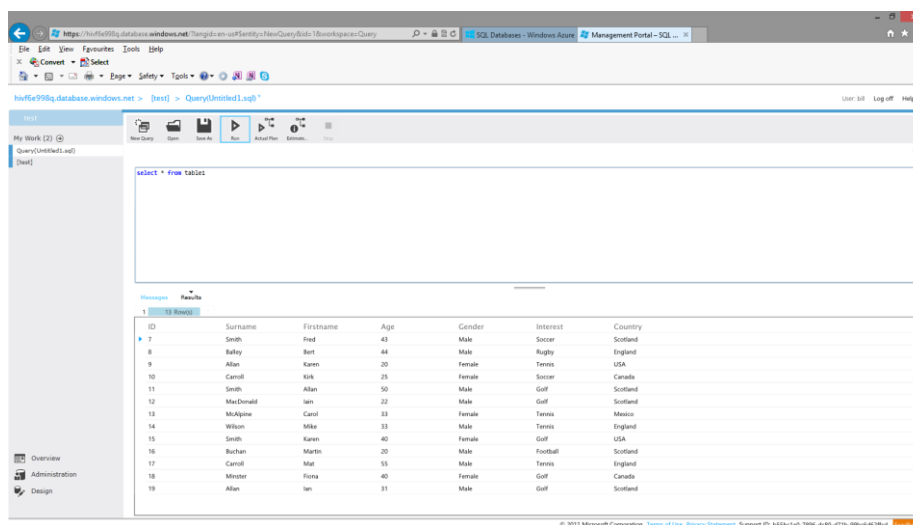


Figure 1: Sample

Hint: Sample queries are at: <http://asecuritysite.com/database1/db>

7 ASPX Code

Using the code developed in the previous lab, create a Web site which integrates with your code. The button (or link) should implement the SQL command and the table should show the result.

8 Northwinds

Now create a new database and upload the following:

<http://billatnapier.com/nwind.zip>

Perform the following queries:

- One at a time, view all the tables (Categories, Customers, [Order Details], and so on.
- Find customers in Mexico
- Find customers in US or UK
- Find the number of customers in US or UK
- Find the number of customers in the database
- Find orders where France is the shipping country
- Find orders where it freight weights over 40
- Find suppliers who in the UK but not in London
- Find customers whose company name begins with A
- Find the number of customers whose company name begins with B
- What is the name of product 18?
- What is the name of products with an ID greater than 10?
- How were hired after Jan 17, 1993?
- The products for product ID of 4 (Dairy Products) which have less than 10 units left?
- Order products by unit price (ID, Price, and Product Name)
- Order products by unit price (ID, Price, and Product Name) - highest first
- Order products by unit price (ID, Price, and Product Name) with each category
- Show the number of condiments as MyCondiments for Category ID of 2

Hint: samples are at : <http://asecuritysite.com/database1/db5>

9 AdventureWorks

Now integrate the following database:

<http://billatnapier.com/AdventureWorks.zip>

and do the following:

- Find productID, name and price for products
- Find ID the sales information from the state of Washington
- Find productmodelID and name from productmodel

Hint: samples are at: <http://asecuritysite.com/database1/db6>