Azure Workshop Labs

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# Manage users

## Description

In this walkthrough task we will create a new user for our environment and next we assign user to Resource Group with defined role.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>

Click on Menu button on left top corner of the Azure portal and select **Azure Active Directory** from the list.  
If there is no **Azure Active Directory** position, click on **All Services**, next fill **Azure Active Directory** in Search field and click on **Azure Active Directory** link.

1. Go to section **Manage** / **Users** and click on **New user** link on top of page.
2. Choose **Create user** option and fill the form

Username: For example, <your-first-name>

Name: For example, <Your-Name and Surname>

Password: Choose **Auto-generate password** and check option **Show Password**

Note! Remember to copy username (with domain) and initial password.

**Congratulations!** You have created a new user in your tenant (Azure Active Directory).

1. Click on Menu button on left top corner of the Azure portal and select **Subscriptions** from the list.  
   If there is no **Subscriptions** position, click on **All Services**, next fill **Subscriptions** in Search field and click on **Subscriptions** link.
2. Choose your Subscription, and when new page opened choose **Access control (IAM)** option.
3. Click **Add** link on top of the page, choose **Add co-administrator**, and select your newly created user from the list. You dan use search form. Next click **Add** button from below.

You can check if user is subscription co-administrator – using Check access form.

**Congratulations!** You added a user to co-administrator to your subscription.

1. Click on Menu button on left top corner of the Azure portal and select **Resource groups** from the list.  
   If there is no **Resource groups** position, click on **All Services**, next fill **Resource groups** in Search field and click on **Resource groups** link.
2. Click on **Add** button on top of the page and fill form

Subscription: <Your Subscription >

Resource group: **az900-rg-ro**

Region: **North Europe**

1. Click on **Review and Create** and next on **Create** button on bottom of the page.
2. Open your newly created Resource Group and choose **Access control (IAM)** option
3. Click **Add** on top of the page and choose **Add role assignment** option. Fill form

Role: **Reader**

Assign access to: **Azure AD user, group, or service principal**

Select: **Choose your previously created user from the list**

1. Click **Save** on bottom of the page.

**Congratulations!** You assign Reader (Read only) role to username to selected Resource Group.

# Azure Virtual Network

## Description

In this walkthrough task we will create a virtual network with two subnets. We also create a Network Security Group (service for network filter) to separate both subnets. Subnets are like VLANs from on-prem environment.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Click on Menu button on left top corner of the Azure portal and then choose Create a resource on the top.
3. In the search box above the list of Azure Marketplace resources, search for Virtual Network, then click on it.  
   You will receive page with Overview about service and pricing Plans. Click Create button.
4. In the Basics tab, fill form details:

Subscription: **<Your Subscription>**

Resource Group: Click on **Create new**, and then type **az900-rg** for the name.

Name: **myVNET**

Region: **North Europe**

1. Go to next step – **IP Addresses**
2. Leave IPv4 address space default value **172.16.0.0/16**.
3. Click on **Add subnet** button, and when new dialog box appears fill the form and click Add at the bottom of page.

Subnet name: **DMZ-Zone**

Subnet address range: **172.16.1.0/24**

Services Endpoints: leave default

1. Go to next step – **Security**, and leave all values default
2. Click on **Review + create** button below. Once Validation is passed click the **Create button**.
3. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.  
   And search for **Network Security Group** service and Create it.
4. Fill form:

Subscription: **<Your Subscription>**

Resource Group: Select previously created **az900-rg**

Name: **myNSG-DMZ**

Region: **North Europe**

1. Click on **Review + create** button below. Once Validation is passed click the **Create button**.
2. Create secondary Network Security group (repeat steps from 10). For new NSG use other name **myNSG-Default.**
3. Once the Network Security Group are created, go to the Resource Group you placed them click on previously created Virtual Network (myVNET).
4. Click on Settings / Subnets section and click on Default subnet.
5. In middle of screen you should find option Network security group. Choose myNSG-Default from drop-down list and click on Save button on top of page. Close page to back to previous items.
6. Go to the Resource Group **az900-rg** and click on primary Network Security Group (**myNSG-DMZ)**.
7. Open Settings / Subnets section.
8. Click on **Associate** button on top of page, choose previously created VNET (**myVNET**), and choose Subnet (**myNSG-DMZ**). Click on **OK** at the end.

**Congratulations!** You have deployed VNET with two subnets.  
You also associate two Network security groups with each of them.

1. Let’s configure first NSG (**myNSG-DMZ**). You can find it in Resource Group, but you can also use search box on top of the page.
2. When opened, click on Settings / Inbound security rules section.
3. Click on **Add** button on top of the page, and fill form, and click **Add**.

Source: **Any**

Source port ranges: **\***

Destination: **Any**

Destination port ranges: **443**

Protocol: **Any**

Action: **Allow**

Priority: **100**

Name: **Port\_HTTPS**

1. Open secondary NSG myNSG-Default and open Settings / Inbound security rules section.
2. Click on **Add** button on top of the page, and fill form, and click **Add**.

Source: **IP Address**

Source IP addresses/CIDR ranges: **172.16.1.0/24** (this is DMZ Subnet address range)

Destination: **Any**

Destination port ranges: **443**

Protocol: **Any**

Action: **Allow**

Priority: **100**

Name: **Port\_HTTPS\_from\_DMZ**

**Note**: You can assign NSG to each subnet to create filtering policy between them. You can also assign NSG to Virtual Machine Network Interfaces.

**Congratulations!** You create two filtering policies. Which allow connection from Internet to DMZ, and second which allow connection to Default only from DMZ on HTTPS (443) port.

**Note**: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not incur unexpected costs. Remove unused resources by deleting the Resource Group that the unused resources belong to.

# Azure Virtual Machine

## Description

In this walkthrough task we will create a virtual machine in Azure via the Azure Portal, configure it as a web server and connect to the web server over the internet.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.
3. In the search box above the list of Azure Marketplace resources, search for **Windows Server 2016 Datacenter**, then click on it. You will receive page with Overview about service and pricing Plans. Click **Create** button.
4. In the Basics tab, fill form details

Subscription: **<Your Subscription>**

Resource Group: Click on **Create new**, and then type **az900-rg** for the name.

Virtual machine name: **myVM**

Region: **North Europe**

Availability options: default value

Image: default value

Azure Spot instance: No

Size: Select size of your VM – click on Select Size, then Select B2ms size and click on Select at the bottom of the screen

1. Under the Administrator account section, provide a username and password

Username: **azureuser**

Password: Create a new password. Password must be at least 12 characters long and meet the defined complexity requirements.

1. Under Inbound port rules

Public inbound ports: **Allow selected ports**

Select inbound ports:select **RDP (3389)** and **HTTP (80)** from the drop-down.

These are to allow us to connect to the virtual machine using RDP over port 3389 and then to see a web page display over HTTP on port 80.

1. Go to next step – **Disks**

OS disk type: **Standard HDD**

Other settings leave with default values.

1. Go to the **Networking** step.
2. Do not change anything and go to **Management** step**.**

Boot diagnostics: **Off**

OS guest diagnostics: **Off**

1. Leave the remaining defaults and then select the **Review + create button** at the bottom of the page.
2. Once Validation is passed click the **Create button**.  
   It can take approx. three to five minutes to deploy the virtual machine.
3. Once the virtual machine is created, go to the Resource Group you placed the virtual machine in and open the virtual machine, then click the **Connect** button on the virtual machine properties page.

**Note**: The following directions tell you how to connect to your VM from a Windows computer. On a Mac, you need an RDP client such as this Remote Desktop Client from the Mac App Store and on Linux virtual machine you could connect directly from a bash shell using SSH.

1. In the Connect to virtual machine page, keep the default options to connect by DNS name over port 3389 and click Download RDP File.
2. Open the downloaded RDP file and click Connect when prompted.
3. In the Windows Security window, select More choices and then Use a different account.  
   Type the username **.\azureuser** enter password you created for the virtual machine, and then click **OK**.
4. You may receive a certificate warning during the sign-in process.  
   Click **Yes** or to create the connection and connect to your deployed VM.  
   You should connect successfully.

**Congratulations!** You have deployed and connected to a Windows Server virtual machine in Azure

If you wish and have time you could also make the deployed server a functioning web server and make a web page available publicly, by continuing with the following steps.

1. Open a PowerShell command prompt on the virtual machine, by clicking the **Start** button, typing **PowerShell** right clicking **Windows PowerShell** in the menu and selecting **Run as administrator**
2. Install the Web-Server feature in the virtual machine by running the following command in the PowerShell command prompt.

Install-WindowsFeature -name Web-Server –IncludeManagementTools

1. When completed you should see a prompt stating Success with a value True, among other items in the output. You do not need to restart the virtual machine to complete the installation. Close the RDP connection to the VM.
2. Back in the portal, select the VM and in the overview pane of the VM, use the Click to copy button to the right of the IP address to copy it and paste it into a browser tab.
3. The default IIS Web Server welcome page will open and is available to connect to publicly via this IP address, or via the fully qualified domain name.

**Congratulations!** You have created a web server that can be connected to publicly via this IP address, or via the fully qualified domain name. If you had a web page to host, you could deploy those source files to the virtual machine and host them for public access on the deployed virtual machine.

**Note**: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not incur unexpected costs. Remove unused resources by deleting the Resource Group that the unused resources belong to.

# Azure Container Service

## Description

In this walkthrough, you will create, configure, and deploy a Docker container to Azure Container Instances (ACI) in Azure Portal. The container is created from an image template called **microsoft/aci-helloworld**. The image packages a small web application, written in Node.js, and serves a static HTML page.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.
3. In the search box above the list of Azure Marketplace resources, search for **Azure Container Instance**, then click on it. You will receive page with Overview about service and pricing Plans. Click **Create** button.
4. Provide the following basic details for the new container instance:

Container name: **mycontainer**

Container image type: **Public**

Container image: **microsoft/aci-helloworld**

Subscription: **Choose your subscription.**

Resource group: Select Create new, then type **az900-rg**, and select OK.

Location: Use the dropdown to choose the Azure region that is closest to you.

Press the OK button.

1. Configure the new container instance as follows.

DNS name label: **Specify a DNS name label for your container.**

1. The DNS name label you specify must be unique within the Azure region where you create the container instance. Your container will be publicly reachable at http://**<dns-name-label>**.**<region>**.azurecontainer.io. If you receive a DNS name label not available error message, specify a different DNS name label.

Leave all other settings in the Configuration pane at their default values.

Select OK to start the automatic validation process.

1. When the validation process has passed, review the configuration summary, and select the OK button to begin deploying the container.
2. When the deployment starts, a notification appears in Azure Portal indicating the deployment is in progress. Another notification is displayed when the container deployment has completed successfully. Wait for the deployment succeeded notification before going to Step 6.
3. Obtain the **Fully Qualified Domain Name (FQDN)**, in Azure Portal, by opening the Overview pane for the container group and navigating to **Resource Groups** > **az900-rg** > **mycontainer**.  
   Make a note of the FQDN of the container instance, as well its Status.
4. When the Status value of the container instance is Running, navigate to the container's FQDN in a web browser.

**Note**: You can also navigate to the container's IP address in your browser. You can obtain the IP address by following Step 6 and making a note of the IP address instead of the FQDN.

**Congratulations**! You have used Azure Portal to deploy an application to a container in Azure Container Instances successfully.

**Note**: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not incur unexpected costs. Remove unused resources by deleting the Resource Group that the unused resources belong to.

# Azure SQL Database

## Description

In this walkthrough task we will create a Simple Azure SQL Database, then we configure policy to access SQL databases from your IP. Finally, we will connect to database using SQL Management Studio.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.
3. In the search box above the list of Azure Marketplace resources, search for **SQL Database**, then click on it. You will receive page with Overview about service and pricing Plans. Click **Create** button.
4. In the Basics tab, fill form details

Subscription: **<Your Subscription>**

Resource Group: Click on **Create new**, and then type **az900-rg** for the name.

1. Next, we will configure database and database server.

The Server name label you specify must be unique within the whole Azure. Your name will be publicly reachable at http://**<dns-name-label>**.database.windows.net. If you receive a DNS name label not available error message, specify a different DNS name label.

Database name: **sqldb01**

Server: Click on **Create new**, and fill details:

Server name: **dns-name-label**

Server admin login: **azsqladmin**

Password: Create a new password. Password must be at least 12 characters long and meet the defined complexity requirements.

Location: **North Europe**

Want to use SQL elastic pool? No

Compute + storage: change to **5 (Basic)**

1. On **Networking** tab leave default values
2. On **Additional settings** tab change Data source to **Sample**, which create sample database for us.
3. Next click on **Review + Create**, and after verification click **Create**. Creation a SQL Database will take few minutes, wait till end.
4. Once the service is created, go to the Resource Group you placed the SQL database in and open service tab. Click on **Firewall settings** link on top of the page to open configuration.
5. Click on **Add client IP**, on top of page to add your IP address to list of allowed addresses to connect to database. Click **Save** to finish.

**Congratulations**! You have configured SQL Database using Azure Portal. Now you can connect to your newly created resource from your favorite tool or just from application.

1. Download and install SQL Server Management Studio (SSMS). You can download binaries from <https://aka.ms/ssmsfullsetup>

**Note**: To manage SQL you can use SSMS tool or Visual Studio Code from Windows. On MacOS or Linux you can use Azure Data Studio (<https://database.guide/what-is-azure-data-studio/>).

1. After install connect to your SQL Database using correct parameters:

Database server: **dns-name-label**.database.windows.net, for dns-name-label use your own created name for Azure SQL Server

Username: **azsqladmin**

Password: Your password, which you create during configuration

**Congratulations**! You’re connected to Azure SQL Database.

**Note**: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not incur unexpected costs. Remove unused resources by deleting the Resource Group that the unused resources belong to.

# Azure App Service

## Description

In this walkthrough task we will create a Simple webpage using App Service.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.
3. In the search box above the list of Azure Marketplace resources, search for **App Service Plan**, then click on it. You will receive page with Overview about service and pricing Plans. Click **Create** button.
4. In the Basics tab, fill form details

Subscription: **<Your Subscription>**

Resource Group: Click on **Create new**, and then type **az900-rg** for the name.

Name: **az900-asp**

Operating System: **Linux**

Region: **North Europe**

Change Sku and Size to: **Dev/Test F1** plan

1. Next click on **Review + Create**, and after verification click **Create**. Creation a SQL Database will take few minutes, wait till end.
2. Click on Menu button on left top corner of the Azure portal and then choose **Create a resource** on the top.
3. In the search box above the list of Azure Marketplace resources, search for **Web App**, then click on it. You will receive page with Overview about service and pricing Plans. Click **Create** button and fill form
4. The Web App name label you specify must be unique within the whole Azure. Your name will be publicly reachable at https://**<dns-name-label>**.azurewebsites.net. If you receive a DNS name label not available error message, specify a different DNS name label.

Subscription: **<Your Subscription>**

Resource Group: Choose **az900-rg**.

Name: **dns-name-label**

Publish: **Code**

Runtime stack: **Node 12 LTS**

Operating System: **Linux**

Region: **North Europe**

App Service Plan: Should be selected automatically to **az900-asp**

1. Next click on **Review + Create**, and after verification click **Create**. Creation a SQL Database will take few minutes, wait till end.
2. After finish open your **Web App** from **Resource Group**. You can check that URL of your website will match your **dns-name-label**. Click on URL to open your created website.

**Congratulations**! You successfully created Web Site using Azure App Services.

# Azure Storage

## Description

In this walkthrough task we will create a storage account, then create a blob storage container within that storage account, then upload a block blob, view and edit the blob file within the blob container in Azure, and then download the block blob file.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Select All services on the upper left-hand side of the Azure Portal.  
   In the All services filter box, type **Storage Accounts**. As you begin typing, the list filters based on your input. Select **Storage Accounts**.
3. On the Storage Accounts window that appears, if there are no storage accounts present you can select Create storage account, or if there are already storage accounts present, this option will not be present and you can choose the option + Add.
4. Complete the Create storage account blade with the following details

Subscription: **<Select your subscription>**

Resource group: Select Create new, enter **az900-rg**, then select OK.

Storage account name: <this must be between 3-24 characters in length, can be numbers and lowercase only, and must be unique across Azure>

Location: **East US**

Performance: **Standard**

Account kind: Leave the default value **StorageV2 (general purpose v2)**\*

Replication: **Locally redundant storage (LRS)** Access tier (default) **Hot**

1. Select Review + Create to review your storage account settings and allow Azure to validate the configuration.  
   Once validated select Create.
2. Verify its successful creation by going to the resource group just created and locate the storage account.
3. Open the storage account and scroll in the left menu for the storage account, scroll to the Blob service section, select Blobs and then select the + Container button.
4. Configure the blob container as below and select OK when complete to create the blob container.Setting Value Name i.e. **blob1**  
   The container name must be lowercase, must start with a letter or number, and can include only letters, numbers, and the dash (-) character.  
   Public access level leave the default value i.e. **The default level is Private** (no anonymous access)
5. The container should be created and available.

We will upload a block blob to your new container.  
Select the container to show a list of blobs it contains. Since this container is new, it won't yet contain any blobs**Note**: Block blobs consist of blocks of data assembled to make a blob. Most scenarios using Blob storage employ block blobs. Block blobs are ideal for storing text and binary data in the cloud, like files, images, and videos.

1. Create a .txt file on your local machine, named **blob1.txt**, and enter some text into it, such as this is a blob file or something like that.
2. Select the Upload button to upload a blob to the container.  
   Browse your local file system to find the file you created in the previous steps to upload as a block blob, Click on the Advanced arrow, leave the default values as they are, just note them, and then select Upload.

**Note**: You can upload as many blobs as you like in this way. You'll see that the new blobs are now listed within the container.

1. View the uploaded block blob by right clicking on the blob file that was uploaded and selecting View/edit blob
2. You can download a block blob by right clicking on the block blob and selecting Download. The blob file opens in a browser and is then downloadable by right clicking on the file and selecting save as.

**Congratulations**! You have created a storage account, created a blob storage container within that storage account, then uploaded a block bob, viewed and edited the block blob in the blob container and then downloaded the block blob.

**Note**: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not incur unexpected costs. Remove unused resources by deleting the Resource Group that the unused resources belong to.

# Azure Virtual Machine from Azure CLI

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage <https://azure.microsoft.com/en-us/free/>.

You will need also an Azure CLI environment. For this walkthrough we use Azure Cloud Shell, but you can also install Azure CLI on your local environment such as a Windows, Linux or MacOS.

**Note**: For install Azure CLI see the Install the Azure CLI page. <https://docs.microsoft.com/en-us/cli/azure/install-azure-cli?view=azure-cli-latest>

## Steps

1. Sign into the Azure Cloud Shell at <https://shell.azure.com/>.

**Note:** You can also get access to cloud shell from Azure Portal website. You must click on Shell icon on top of Azure Portal, just at right from search button.

1. Cloud Shell utilizes Azure File storage to persist files across sessions. On initial start, Cloud Shell prompts you to associate a new or existing file share to persist files across sessions.  
   If popup box appear, choose your subscription and click on **Create storage** button. Azure will create a Storage Account to store all your data for Cloud Shell.
2. Next, choose **Bash**, from drop-down menu on top of screen.

**Note:** Azure Cloud shell allow to use Copy-Paste commands. Each browser will use their own key combinations. Usually if you right-click on Cloud Shell window it will allow you to Paste command.

1. Create a resource group to deploy your resources to, by running the following command:

az group create --name az900-rg --location northeurope

1. We will now deploy a virtual machine and configure it using an Azure Resource Manager template.  
   The template is available on GitHub at the location <https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/101-vm-simple-windows/azuredeploy.json>, and we will call the script using an Azure CLI command and some other parameters.

Before deploying we will validate the template and command by running the following Azure CLI command, substituting the values with your own, specifying a username and password and a unique name for the virtual machine DNS label prefix value.

The command should run successfully without error, identify what is causing the error, modify it and run the command again until it does validate successfully.

az group deployment validate --resource-group az900-rg \  
 --template-uri https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/101-vm-simple-windows/azuredeploy.json \  
 --parameters adminUsername=$USER \  
 --parameters adminPassword=$PASSW \  
 --parameters dnsLabelPrefix=$DNS\_LABEL\_PREFIX

1. Deploy the resource by running the following command, substituting the same values as earlier:

az group deployment create --name MyDeployment \  
 --resource-group az900-rg \  
 --template-uri https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/101-vm-simple-windows/azuredeploy.json \  
 --parameters adminUsername=azureadmin \  
 --parameters adminPassword=Pa$$w0rd \  
 --parameters dnsLabelPrefix=azdemomod02-vm1

1. Verify the deployment by signing into the Azure portal at <https://portal.azure.com>
2. Go to the resource group you created **az900-rg** and verify the virtual machine and resources are present, note the name of the virtual machine is **SimpleWinVM**
3. Obtain a list of the virtual machines present in your subscription, and display only the resource group and virtual machine name by running the command:

az vm list --query [].[resourceGroup,name] --out tsv

**Congratulations!** You have created a virtual machine using the Azure CLI and an Azure Resource Manager template, then verified that deployment using the Azure CLI in the Azure Cloud Shell.

**Note**: Don't forget to delete any resources you deployed to avoid incurring additional costs from them.

# Security Center

## Description

In this walkthrough task we will access the Trust Center and browse through some of its content.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage.

## Steps

1. Sign into the Azure portal at <https://portal.azure.com>
2. Go to Azure Security Center demo

# Trust Center

## Description

In this walkthrough task we will access the Service Trust Portal (STP) and some of its resources and content, and finally we will access Compliance Manager and some of its available resources.

## Prerequisites

You require need an Azure subscription to perform these steps. If you don't have one you can create one by following the steps outlined on the Create your Azure free account today webpage.

## Steps

1. Go to the Service Trust Portal (STP) at the URL <https://servicetrust.microsoft.com/>
2. Scroll down through the Trust Center, and click on View all audit reports, and the select some of the industries to filter some of the audit reports.
3. Browse through some of the audit reports, and when finished return to the Trust Center home page and browse through some of the other items available on the page, such as Documents and Resources, Industry Compliance, Services Risk Assessment etc

**Access Compliance Manager**

1. On the Microsoft Service Trust Portal at the URL <https://servicetrust.microsoft.com/>, select Compliance Manager from the list of options at the top.
2. When prompted to sign in enter your credentials for your Microsoft account i.e. as stated in the message when signing in to Compliance Manager, To access this resource, you must be signed in to your cloud service (Office 365, Dynamics 365, Azure, or other), click Sign In.
3. Once logged in, take some time to browse through the various elements available within Compliance Manager

**Congratulations!** In this walkthrough task you accessed the Trust Center and browsed through some of its content. You then accessed the Service Trust Portal (STP) and some of its resources and content, and finally you accessed Compliance Manager and some of its available resources.

**Note**: Remember to delete the resources you have just deployed, if they are still present and you are no longer using them to ensure you do not incur costs for running resources. You can delete all deployed resources by deleting the resource group in which they all reside.

# Pricing Calculator

## Steps

1. In a browser, navigate to the Azure Pricing Calculator webpage <https://azure.microsoft.com/en-us/pricing/calculator/>.
2. To add details of your VM configuration, select **Virtual Machines** from the Products tab.  
   Inside the Virtual Machines added message dialog, choose **View**.
3. Enter a name for your Azure Pricing Calculator estimate, and a name for your VM configuration.  
   This walkthrough example uses **My Pricing Calculator Estimate** for the estimate, and Windows VM for the VM configuration.
4. Modify the default VM configuration to match the following VM details.

Region: **North Europe**

Operating system Type: **Windows (OS only)**

Tier Instance: **Standard A2: 2 Core(s), 3.5 GB RAM, 135 GB Temporary storage**

**Note**: The VM instance specifications and pricing may differ from those in this example. Follow this walkthrough by choosing an instance that matches the example as closely as possible. To view details about the different VM product options, choose Product details from the More info menu on the right.

1. Set the Billing Option to **Pay as you go**.  
   In Azure, a month is defined as 730 hours.  
   If your VM needs to be available 100 per cent of the time each month, you set the hours-per-month value to 730. This walkthrough example requires one VM to be available 50 per cent of the time each month.  
   Leave the number of VMs set at 1 and change the hours-per-month value to **365**.
2. In the Managed OS Disks pane, modify the default VM storage configuration by adding the following details.

Tier Disk size: **Standard HDD S30: 1024 GiB**

Number of disks: **1**

Snapshot: **Off**

Storage transactions: **10,000**

1. To add networking bandwidth to your estimate, go to the top of the Azure Pricing Calculator webpage.  
   Select **Networking** from the product menu on the left, then choose the **Bandwidth** tile.  
   Inside the Bandwidth added message dialog, select View.
2. Add a name for your VM bandwidth configuration.  
   This walkthrough example uses the name Bandwidth: **Windows VM**. Modify the default bandwidth configuration by adding the following details.

Region: **North Europe Zone**

Outbound Data Transfer Amount: **50 GB**

1. To add an Application Gateway, return to the top of the Azure Pricing Calculator webpage.  
   From within the Networking product menu, choose the **Application Gateway** tile.  
   Inside the Application Gateway message dialog, select View.
2. Add a name for your Application Gateway configuration. This walkthrough uses the name App Gateway: **Windows VM**.  
   Modify the default Application Gateway configuration by adding the following details.

Region: **North Europe**

Tier: **Basic**

Size: **Small**

Instances: **1**

Hours: **730**

Data processed: **50 GB**

Zone 1: North America, Europe: **50 GB**

1. Go to the bottom of the Azure Pricing Calculator webpage to view your total.

# Total Cost of Ownership (TCO) Calculator

## Steps

1. In a browser, navigate to the Total Cost of Ownership (TCO) Calculator webpage, <https://azure.microsoft.com/en-us/pricing/tco/calculator/>.
2. To add details of your on-premises server infrastructure, select + Add server workload in the Servers pane.
3. Provide a name for your server workloads definition. This example uses the name Servers: **Windows VMs**.  
   Enter the following details into the TCO Calculator.

Workload: **Windows/ Linux server**

Environment: **Virtual machines**

Operating system: **Windows**

VMS: **500**

Virtualization: **VMware**

Core(s): **8**

RAM: **16**

Optimize: **CPU**

1. Select + Add server workload to make a row for a new server workloads definition. Provide a name for the server workloads definition. This example uses the name Servers: Linux VMs. Enter the following details into the TCO Calculator.

Workload: **Windows/ Linux server**

Environment: **Virtual machines**

Operating system: **Windows**

VMS: **500**

Virtualization: **VMware**

Core(s): **8**

RAM: **16**

Optimize: **CPU**

1. This example definition does not require a database. Leave the Databases pane empty. In the Storage pane of the TCO Calculator, provide a name for your storage infrastructure definition. Enter the following details into the TCO Calculator.

Storage type: **Local Disk / SAN**  
Disk type: **HDD**Capacity: **60 TB**Backup: **0 TB**Archive: **0 TB**

1. In the Networking pane of the TCO Calculator, enter the following details, then select Next.

Outbound bandwidth: **15 TB**

1. Explore the options and make any adjustments that you require.  
   The currency used in this example is Euros. No other adjustments are required by this example.  
   Select Next, at the end of the page.
2. Review the Azure cost saving recommendations and visualizations in the TCO calculator report.  
   This example requires you to adjust the Timeframe to 3 years, and the region to North Europe.
3. To modify the information, you provided to the TCO calculator, go to the bottom of the page, and select Back. To save or print a PDF copy of the report select Download.

**Congratulations**! You downloaded a cost comparison report from the TCO Calculator in Azure.