Azure Fundamentals – Homework

**Important:** **at the end of the day, please stop all running services (VMs).**

# Day 1

1. Create a resource group:
   * **Name:** give it a unique name. Remember it as you will use this to deploy your resources.
   * **Location:** use one of the cheaper locations available (recommended: eastus, eastus2). More information here <https://azureprice.net/regions>.
   * **Tags:** Owner -> Your Name.
2. In the previously created resource group create a VNET:
   * **Name:** the general naming convention is a combination of the resource group name and resource type (eg: resourcegroup1vnet, dev01-vnet, tst02-vnet, etc).
   * **Location:** use the same location as the resource group.
   * **Address space:** use a /16 prefix.
   * **Subnets:** create 2 subnets within the address space (with prefixes /24 and /30).
   * **Tags:** Owner -> Your Name.
3. Create a Linux-based VM:
   * **Image:** Ubuntu Server (or whatever Linux distro you’re comfortable with).
   * **Size:** B1.
   * **Authentication type:** choose whatever you’re comfortable with (SSH key preferable).
   * **Disks:** Standard SSD.
   * **Networking:** use the existing VNet and assign it to the 1st subnet.
   * **Tags:** Owner -> Your Name.
4. Create a Windows-based VM:
   * **Image:** Windows Server.
   * **Size:** B1.
   * **Disks:** Standard SSD.
   * **Networking:** use the existing VNet and assign it to the 2nd subnet.
   * **Tags:** Owner -> Your Name.
5. Enable VM login via Azure AD.
6. Log on one VM and try to ping the other. Do this for both VMs.
7. Add a new disk to each VM (Standard HDD, size irrelevant). Mount these disks from within the VMs.
8. Scale the VMs to another size (recommended: other B series size).
9. Enable the auto-shutdown feature and check the send notification option (send an email to your address).
10. What’s the difference between simply stopping a VM and deallocating it?
11. Navigate to any of the NSGs (Network Security Groups). What happens if you delete the default rule? (Hint: try connecting to the VM associated to that NSG).
12. Create a Load balancer and use the previously created VMs as a backend pool.
13. Create a Web App on an App Service Plan (size B1). Add an access restriction to allow your IP. Access the Web App through your browser to check it’s working.
14. Scale the App Service to a P1 size. Add a private endpoint to the previously created VNet (create a new subnet). Check the web app again to see what’s displaying.
15. What’s the difference between the Dev/Test/Production and the Isolated Web Apps?
16. Scale out the Web App to 4 instances. What’s the difference compared to Scaling Up?
17. Create an ACI (Azure Container Instance) using a standard image.
18. Create an ACR (Azure Container Registry). Push an image from another repository (eg: nginx image taken from DockerHub).
19. Create an ACI using the image from the ACR.

# Day 2

1. Create a Storage Account:
   * **Name:** it must be unique at an Azure level.
   * **SKU:** Standard.
   * **Redundancy:** LRS.
   * **Network:** Public endpoint.
2. Upload a file from your computer and check it was uploaded correctly. You can use the [Azure Storage Explorer](https://azure.microsoft.com/en-us/features/storage-explorer/) tool.
3. Create a SQL Server with a Database:
   * **Compute:** Basic 5 DTUs.
   * **Storage:** 2 GB.
   * **Redundancy:** LRS.
   * **Network:** No Access.
   * Check the connection using [SQL Server Management Studio](https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver15), or [Azure Data Studio](https://azure.microsoft.com/en-us/services/developer-tools/data-studio/) (both do roughly the same thing so choose whichever you prefer)
4. Add an IP restriction on the SQL Server to allow your IP.
5. Upgrade the Database to a Standard 10 DTUs with 5 GB of storage.
6. Export the database to the previously created storage account.
7. Import the database using the previous back-up file.
8. Create private endpoints for the SQL Server and Storage Account. You can create a separate subnet for each of these.
9. Export the costs generated by your resources (use the created tag with your name).
10. Create a dashboard by giving it a unique name and adding to it:
    * CPU and Memory percentage for the Web App over the last 3 days. Aggregation set to Max, and time granularity of 15 minutes.
    * CPU percentage for the VMs. Use the same chart to display the metrics of both VMs.

# Future work

If you wish to expand on your knowledge, the next step is to look into redoing these exercises using Az CLI ([install](https://docs.microsoft.com/en-us/cli/azure/install-azure-cli) and [cheatseet](http://thedevopspage.com/azurecli-powershell-cheatsheet)) and ARM/Bicep Templates ([docs](https://docs.microsoft.com/en-us/azure/templates/) and [ARM quickstart templates](https://github.com/Azure/azure-quickstart-templates). Bicep templates can be found in the Gitlab repo).