Show Submission Credentials

P0. Microsoft Azure APIs Microsoft Azure APIs

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Azure API Introduction

Introduction

Learning Objectives

1. Experiment with authenticating Azure SDK using Azure CLI
2. Provision Azure Resource Group using Azure SDK for Python and Java
3. Provision and configure virtual machines using Azure SDK for Python and Java

Introduction

In this primer we will introduce you to the Azure API and familiarize you with how Virtual Machine instances can be managed using Java as well as Python code. This primer will also introduce you to Role-based access control for authenticating Azure Java and Python code to create instances.

Information

General Details

The following table contains some general information about this project:

Prerequisites	Programming experience with Java 8 and Python 3
Primers	Azure Intro
Applicable Cloud Platform	Microsoft Azure
Total Recommended Budget	$5(applicable to all primers)
Tags Required	Key: `Project` Value: `getting-started-with-cloud-computing`

Danger

Accessing 15-319/15-619 Resources

If you decide to experiment with different VM types make sure you use only B-series (or DS series) VMs.

Azure Authentication and Environment Setup

Setup

In order to authenticate Azure SDK using Azure CLI, please first install Azure CLI following the Azure Intro primer.

To connect your Azure CLI to your portal run the command `az login` on your command line. This command will require you to visit https://microsoft.com/devicelogin and authenticate with your Microsoft Azure account.

```
az login
[
    {
        "cloudName": "AzureCloud",
        "id": "<id>",
        "isDefault": true,
        "name": "course-subscrption ...",
        "state": "Enabled",
        "tenantId": "<tenant Id>",
        "user": {
            "name": "<name>",
            "type": "user"
    }
    }
]
```

The output contains a JSON array of all the subscriptions of your Azure account. Please set the default subscription as the Azure subscription you set up during the Account Setup primer. To set the default subscription, use the command:

```
az account set --subscription <Enter the subscription ID here>
```

Creating An Azure VM

To create a VM in Azure, we must also create a resource group and several other resources that the VM depends on:

Resource Group	Azure Resources Groups are logical collections of virtual machines, storage accounts, virtual networks, web apps, databases, and/or database servers
Public IP Address	Used to communicate to the VM once it is instantiated
Virtual Network	Subnet and a Virtual network in which the VM resides
Virtual Interface	Needs a network interface to communicate on the virtual network

The provided example code in the next sections will provision a resource group and all the required resources.

Azure Python API

To provision instances using the Python API use the code provided here:

```
wget https://clouddeveloper.blob.core.windows.net/azure-apis/azure-apis-vm-pytho
n.tgz -O azure-apis-vm-python.tgz
tar -xvzf azure-apis-vm-python.tgz
```

Once you have downloaded your code set the environment variables for the following. Make sure **not** to surround the variables with quotation marks

```
export AZURE_RESOURCE_GROUP_NAME=
export AZURE_VM_USERNAME=
export AZURE_VM_PASSWORD=
export AZURE_VM_NAME=
export AZURE_SUBSCRIPTION_ID=
```

Doing this ensures the safety of your VM credentials should your code fall into the wrong hands.

While setting the password remember to set one that is between 6-72 characters long and must satisfy at least 3 of password complexity requirements from the following: 1) Contains an uppercase character 2) Contains a lowercase character 3) Contains a numeric digit 4) Contains a special character 5) Control characters are not allowed (\a,\t etc)

Install python3 and virtualenv in Linux environment by running:

```
sudo apt update

#Add relevant repositories
sudo apt install -y software-properties-common
sudo add-apt-repository ppa:deadsnakes/ppa
sudo apt update

#Install python and virtualenv
sudo apt install -y python3.8
sudo apt install -y virtualenv
```

Once you have set up everything move to the directory and setup a virtualenv:

```
#Create a virtual environment
virtualenv -p python3 env

#Start the virtual environment
source env/bin/activate

#Install the requirements
pip3 install -r requirements.txt

#Start the script
python3 AzureVMManager.py
```

You can now use the menu to create resource groups and VM instances as well as deallocate and delete the resource group. Feel free to experiment with the code to learn more about how the API works!

You can quit the menu by pressing any key that isn't part of the menu items

Danger

Make sure to destroy **all** resources made for this primer either via the portal or by running the respective JAVA or PYTHON code

Azure Java API

To provision instances using the JAVA API using the code provided here:

```
wget https://clouddeveloper.blob.core.windows.net/azure-apis/azure-apis-vm-java.
tgz -O azure-apis-vm-java.tgz
tar -xvzf azure-apis-vm-java.tgz
```

Once you have downloaded your code set the environment variables for naming the following. Make sure **not** to surround the variables with quotation marks

```
export AZURE_RESOURCE_GROUP_NAME=
export AZURE_VM_USERNAME=
export AZURE_VM_PASSWORD=
export AZURE_VM_NAME=
```

Doing this ensures the safety of your VM credentials should your code fall into the wrong hands.

While setting the password remember to set one that is between 6-72 characters long and must satisfy at least 3 of password complexity requirements from the following: 1) Contains an uppercase character 2) Contains a lowercase character 3) Contains a numeric digit 4) Contains a special character 5) Control characters are not allowed (\a,\t etc)

Once you have set up everything move to the directory:

```
cd azure-apis-vm-java
mvn compile && mvn exec:java -Dexec.mainClass="edu.cmu.scs.cc.AzureVMInstanceMan
ager"
```

You can now use the menu to create resource groups and VM instances as well as deallocate and delete the resource group. Feel free to experiment with the code to learn more about how the API works!

You can quit the menu by pressing anything any key that isn't part of the menu items

Danger

Make sure to destroy **all** resources made for this primer either via the portal or by running the respective JAVA or PYTHON code

Conclusion

Conclusion

You will be using these APIs extensively throughout the course. Use this first week to set and complete small challenges to automate and test using the Azure APIs.