

## Lab 1: Preparing your Hands-On-Lab environment

### What you will learn

In this first lab, you prepare the baseline for executing all hands-on-labs exercises:

- Log on to your Azure subscription;
- Deploy the lab-jumpVM within your Azure subscription;
- Verify and install the required tools to run the lab exercises;
- Deploy the 2-tiered Azure Virtual Machine infrastructure (WebVM and SQLVM);

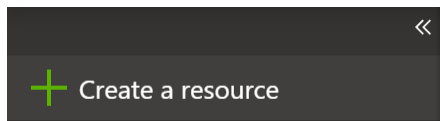
### Time estimate

This lab is estimated to take **60min**, assuming your Azure subscription is already available.

### Task 1: Deploying the lab-jumpVM Virtual Machine using Azure Portal Template deployment

In this task, you start from deploying the “lab-jumpVM” Virtual Machine in your Azure environment. This machine becomes the starting point for all future exercises, as it has most required tools already installed.

1. Once you are logged on to your Azure subscription, select **Create a Resource**



2. In the Search Azure Marketplace field, type “template deployment”

Home > New

## New

Azure Marketplace

See all


Popular

Get started

Recently created


Compute

Networking



Windows Server 2016 VM

[Quickstart tutorial](#)



Ubuntu Server 18.04 VM


[Learn more](#)

3. And select **template deployment** from the list of MarketPlace results. Followed by clicking the **Create** button down at the bottom.

Everything

Filter

Results

NAME	PUBLISHER	CATEGORY
 Template deployment	Microsoft	Compute

4. This opens the **Custom Deployment** blade. Here, select "build your own template in the editor"

## Custom deployment

Deploy from a custom template

### Learn about template deployment

 [Read the docs](#) 

 [Build your own template in the editor](#)

### Common templates

 [Create a Linux virtual machine](#)

 [Create a Windows virtual machine](#)

 [Create a web app](#)

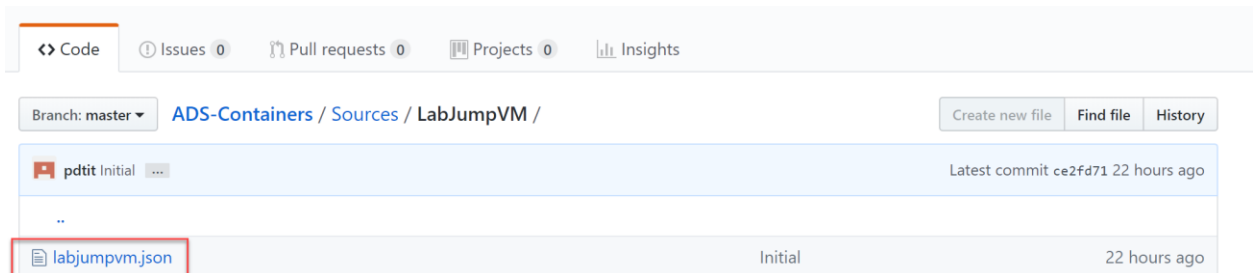
 [Create a SQL database](#)

### Load a GitHub quickstart template

Select a template (disclaimer) 

Type to start filtering...

5. First, from a **second tab** in your browser window, go to the following URL on GitHub, browsing the source files repository for this lab, specifically the LabJumpVM folder:  
<https://github.com/pdtit/ADS-Containers/tree/master/Sources/LabJumpVM>



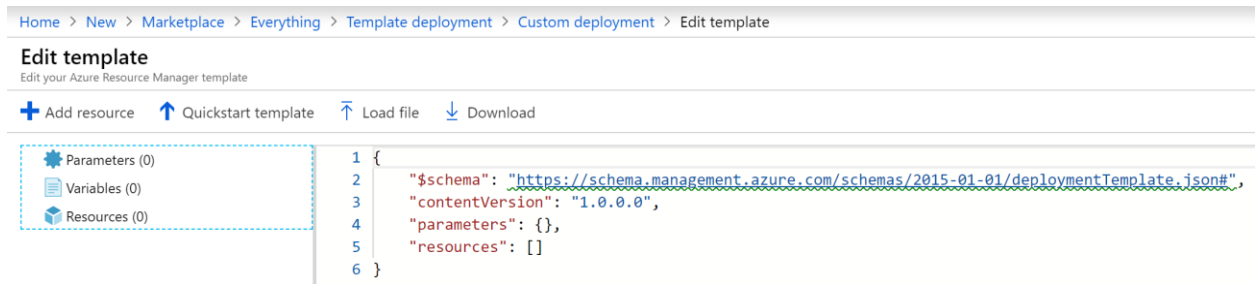
6. **Select** the labjumpvm.json object in there. This exposes the details of the actual JSON deployment file. **Click** the **Raw** button, to open the actual file in your browser.



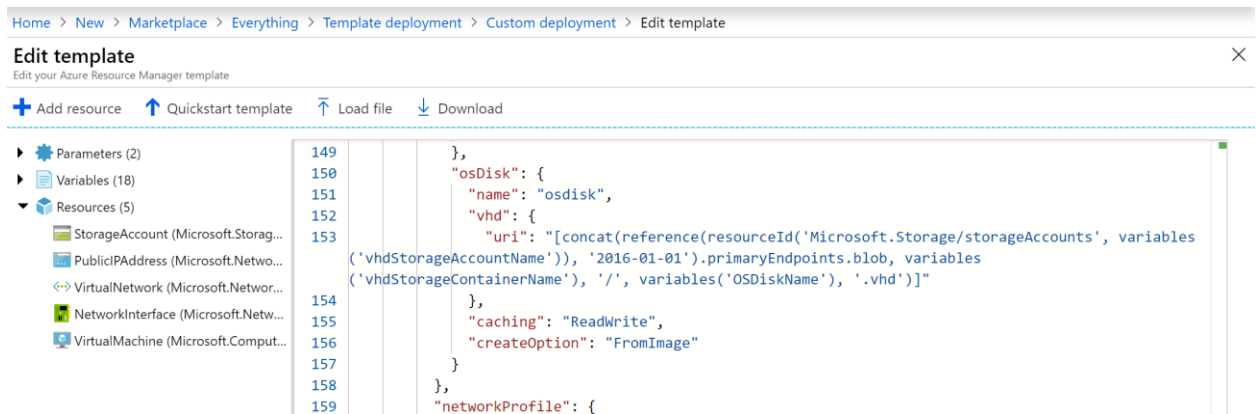
7. Your browser should show the content as follows:

```
{
  "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "adminUsername": {
      "type": "string",
      "minLength": 1,
      "defaultValue": "labadmin",
      "metadata": {
        "description": "Username for the Virtual Machine."
      }
    },
    "adminPassword": {
      "type": "securestring",
      "defaultValue": "L@BadminPa55w.rd",
      "metadata": {
        "description": "Password for the Virtual Machine."
      }
    }
  }
}
```

8. Here, use **Ctrl+A** to select all lines in the JSON file, and use **Ctrl+C** to copy it to the clipboard.
9. **Go back** to the **Azure Portal**; From the **Edit Template** blade, remove the first 6 lines of code you see in there, and **paste** in the JSON content from the clipboard.



10. The Edit template blade should recognize the content of the JSON file, and showing the details in the JSON Outline on the left



11. Press the **Save** button.
12. This **redirects** you back to the Custom deployment blade, from where you will **execute** the actual template deployment, filling in the required fields as follows:
- Subscription: your Azure subscription
  - Resource Group: Create New / SUFFIX-JumpVMRG
  - Location: your closest by Azure Region
  - Admin Username: labadmin (this information is picked up from the ARM-template; although you could change this, we recommend you to not do so for consistency with the lab guide instructions)
  - Admin Password: [L@BadminPa55w.rd](#) (this information is picked up from the ARM-template; although you could change this, we recommend you to not do so for consistency with the lab guide instructions)

## Custom deployment

Deploy from a custom template

### TEMPLATE



Customized template

5 resources

Edit template

Edit parameters

Learn more

### BASICS

\* Subscription

Microsoft Azure Subscription

\* Resource group

Select a resource group

Create new

\* Location

### SETTINGS

Admin Username

Admin Password

### TERMS AND CONDITIONS

A resource group is a container that holds related resources for an Azure solution.

\* Name

ADS-JumpVMRG

OK Cancel

13. When all fields have been completed, scroll down in the blade. Under the terms and conditions section, Check "I agree to the terms and conditions state above", and press the Purchase button.

### TERMS AND CONDITIONS

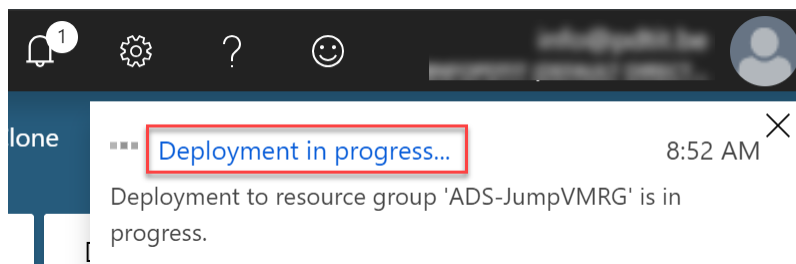
[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree that, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

☒ I agree to the terms and conditions stated above

Purchase

14. This sets off the actual Azure Resource deployment process. From the **notification area**, you can get update information about the deployment.



15. If you click the "...Deployment in progress...", you will get redirected to the Microsoft template Overview blade, showing you the details of each Azure Resource getting deployed.

A screenshot of the 'Microsoft.Template - Overview' blade in the Azure portal. The breadcrumb at the top shows 'Home > Microsoft.Template - Overview'. The main heading is 'Microsoft.Template - Overview' with a sub-heading 'Deployment'. On the left, there is a sidebar with a search bar and a list of tabs: 'Overview' (selected), 'Outputs', 'Inputs', and 'Template'. The main content area has a header with buttons: 'Delete', 'Cancel', 'Redeploy', and 'Refresh'. Below this, a message says 'Your deployment is underway' with instructions to check status, manage resources, or troubleshoot. It includes deployment details: 'Deployment name: Microsoft.Template', 'Subscription: Microsoft Azure Sponsorship', and 'Resource group: ADS-JumpVMRG'. A 'DEPLOYMENT DETAILS' section with a '(Download)' link shows the start time (9/22/2018, 8:52:54 AM), duration (50 seconds), and correlation ID. Below this is a table with columns: RESOURCE, TYPE, STATUS, and OPERATION DETAILS. The table lists six resources, all with a status of 'Created' or 'OK'.

RESOURCE	TYPE	STATUS	OPERATION DETAILS
jumpvm	Microsoft.Compute/...	Created	<a href="#">Operation details</a>
vhdstoragen5br3v4ojk	Microsoft.Storage/st...	OK	<a href="#">Operation details</a>
jumpvmnic	Microsoft.Network/...	Created	<a href="#">Operation details</a>
jumpvmip	Microsoft.Network/...	OK	<a href="#">Operation details</a>
jumpvmVNet	Microsoft.Network/v...	OK	<a href="#">Operation details</a>
vhdstoragen5br3v4ojk	Microsoft.Storage/st...	OK	<a href="#">Operation details</a>

16. Wait for the deployment to complete successfully, which you can see from this detailed view, or from the notification area.

## Notifications



[More events in the activity log](#) →

[Dismiss all](#) ...



### Deployment succeeded



Deployment '[Microsoft.Template](#)' to resource group '[ADS-JumpVMRG](#)' was successful.

[Go to resource group](#)

[Pin to dashboard](#)

by me

a few seconds ago

17. From the notification message, **click** "Go to resource group". (If you already closed the notification message, from the Azure Portal navigation menu to the left, select Resource Groups).

Home > Resource groups > ADS-JumpVMRG

**ADS-JumpVMRG**  
Resource group

Search (Ctrl+/)

Overview  
Activity log  
Access control (IAM)  
Tags  
Events

Settings  
Quickstart  
Resource costs  
Deployments  
Policies  
Properties  
Locks  
Automation script

+ Add Edit columns Delete resource group Refresh Move Assign tags Delete

Subscription (change) Microsoft Azure Sponsorship Subscription ID 0a407898-c07...  
Deployments 1 Succeeded  
Tags (change) Click here to add tags

Filter by name... All types All locations No grouping

5 items Show hidden types

NAME	TYPE	LOCATION
jumpvm	Virtual machine	East US 2
jumpvmip	Public IP address	East US 2
jumpvmnic	Network interface	East US 2
jumpvmVNet	Virtual network	East US 2
vhdstorage5br3v4ojidhm	Storage account	East US 2

18. Click on the **jumpvm Azure Virtual Machine** resource. This redirects you to the detailed blade for the jumpvm resource. Here, **press** the **Connect** button.

Home > Resource groups > ADS-JumpVMRG > jumpvm

**jumpvm**  
Virtual machine

Search (Ctrl+/)

**Connect** Start Restart Stop Move Delete Refresh



19. From the **Connect to Virtual machine** blade, notice the **public IP-address** and **port 3389**. This allows you to establish an RDP session to the Azure VM. Do this by **clicking the Download RDP file** button.

### Connect to virtual machine

×

jumpvm

RDP

SSH

To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.

\* IP address

Public IP address (104.46.119.152) ▼

\* Port number


3389

Download RDP File

20. After the RDP connection file has been **downloaded**, **open** it up, which will launch the **Remote Desktop Connection** to that VM. In the appearing popup window, set the flag to “Don’t ask me again for connections to this computer”.


### Remote Desktop Connection

×



The publisher of this remote connection can't be identified. Do you want to connect anyway?

This remote connection could harm your local or remote computer. Do not connect unless you know where this connection came from or have used it before.



Publisher:

Type:

Remote computer:

Unknown publisher

Remote Desktop Connection

104.46.119.152

☒ Don't ask me again for connections to this computer

Show Details

Connect

Cancel

21. Press the **Connect** button; when it is asking for your **VM machine admin credentials** in the next step, provide the **VM administrator name (labadmin)** as well as its password.

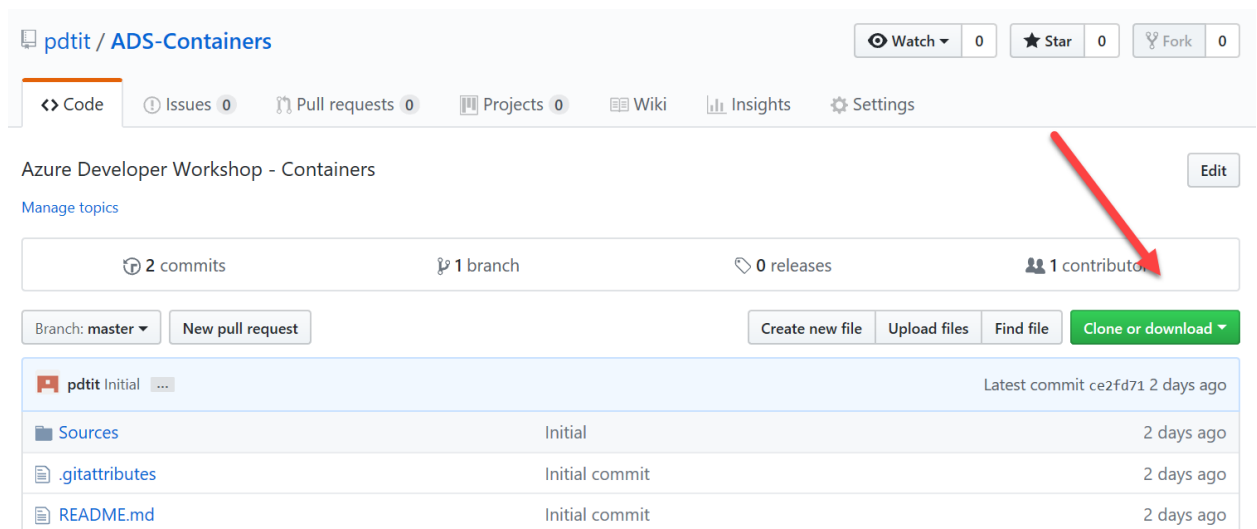
22. Your Remote Desktop session to this Azure VM gets established.
23. **Close** the appearing “**Server Manager**”, you will access it again later.

This completes this task, in which you deployed a Windows 2016 lab-VM, by using Azure Resource Manager template-based deployment.

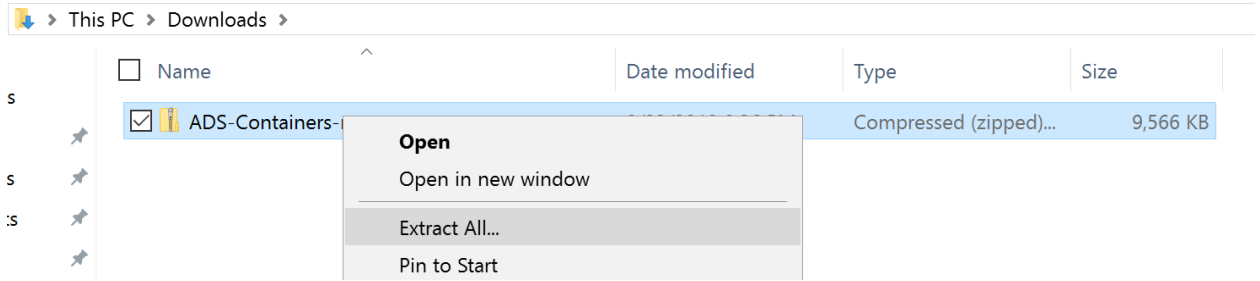
## Task 2: Deploying the baseline Virtual Machine environment using an ARM-template from within Visual Studio 2017

In this task, you run the ARM-template which deploys the baseline Virtual Machine environment you need in the next lab. Deployment will be performed from within Visual Studio 2017.

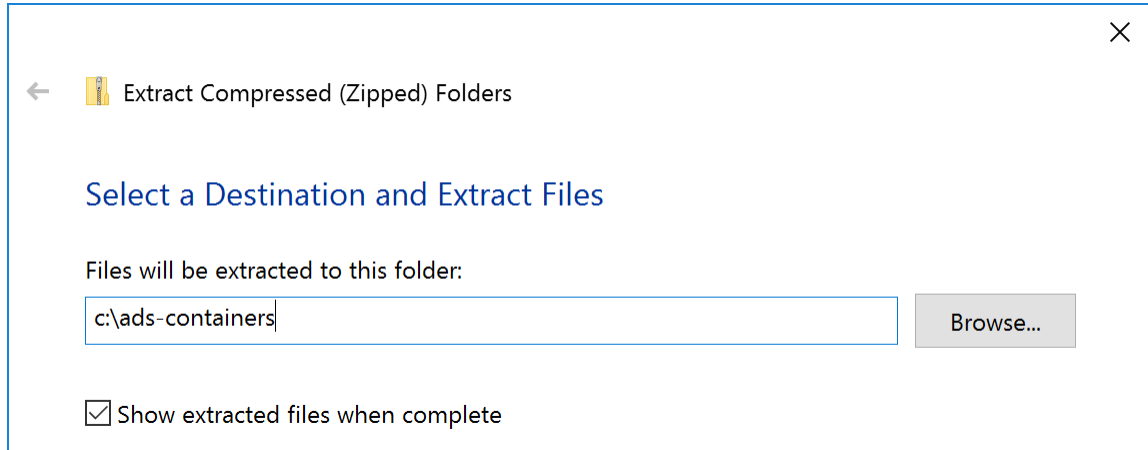
1. From within the lab-JumpVM Virtual Machine RDP-session, open a browser session to <https://github.com/pdtit/ADS-Containers/>, and click the **green Clone or Download** button.



2. From the appearing popup, select **Download Zip**. This downloads the sources directory to the downloads folder on the lab-jumpVM.  
(note: if the Internet Explorer browser doesn't allow downloads, go into its settings / internet options / and enable File Downloads and Font Downloads), and restart the browser.
3. Once downloaded, **open** the downloads folder from within **File Explorer**, right-click the ADS-Containers.zip downloaded file, **choose Extract all...**



4. Extract the files to c:\ADS-Containers, or any other folder location of your choice.



5. Once the extraction is completed successfully, **browse to the folder**. Within the folder, browse to `\ads-containers\ADS-Containers-master\Sources`. Select the compressed file "ProductCat-VM-ARM-Deploy". Right-click this file, choose **Extract all**, and extract its content in a folder of choice, for example `c:\ProductCat-VM-ARM-Deploy`.
6. From the **lab-JumpVM Start Menu** or the shortcut on the desktop, **open Visual Studio 2017**. Since this is the first time you launch Visual Studio after a fresh install, you are greeted with the Visual Studio welcome message.

×

# Visual Studio

Welcome!

Connect to all your developer services.

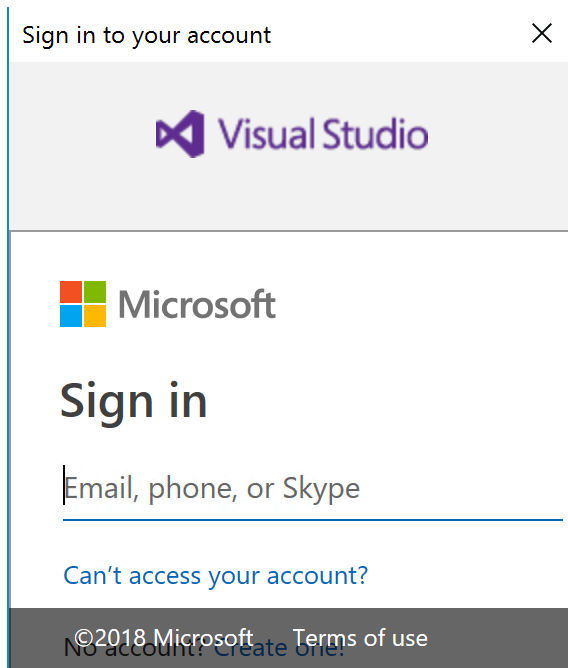
Sign in to start using your Azure credits, publish code to a private Git repository, sync your settings, and unlock the IDE.

[Learn more](#)

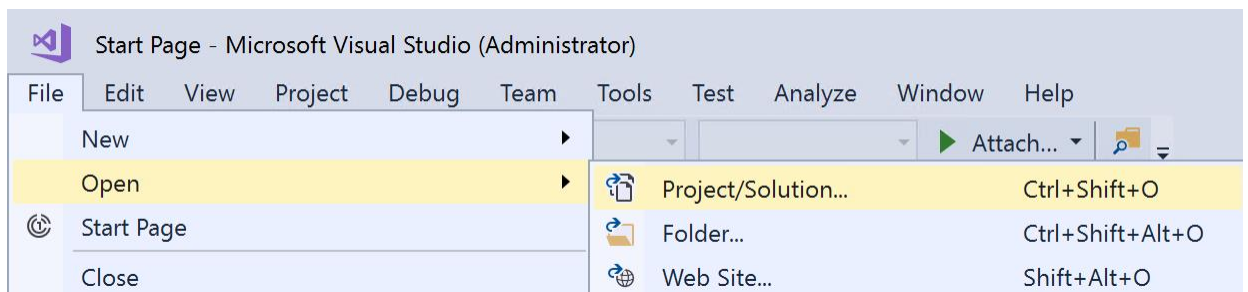
Sign in

Don't have an account? [Sign up](#)

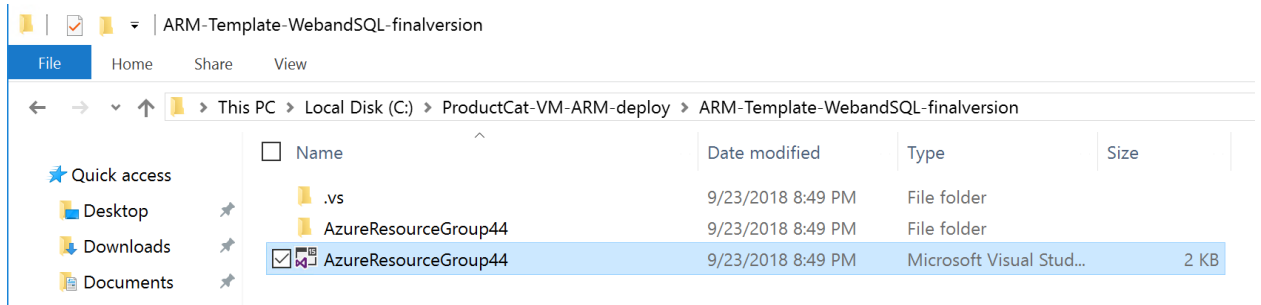
7. It asks you to sign in, so press that button. Here, authenticate with your **Azure subscription** credentials.



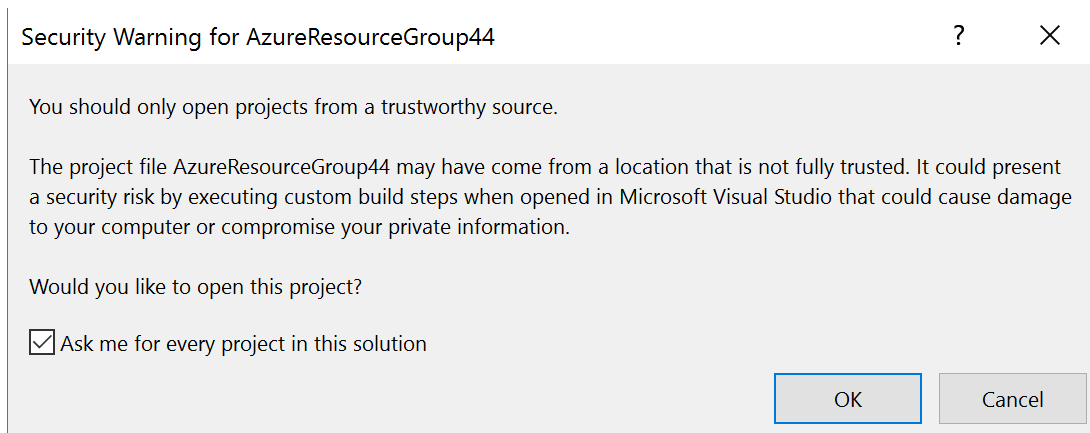
8. After successful authentication, you can choose a layout theme. Select a theme of choice, and wait until the Visual Studio environment completed loading.
9. From the Visual Studio menu, click File / Open / Project/Solution...



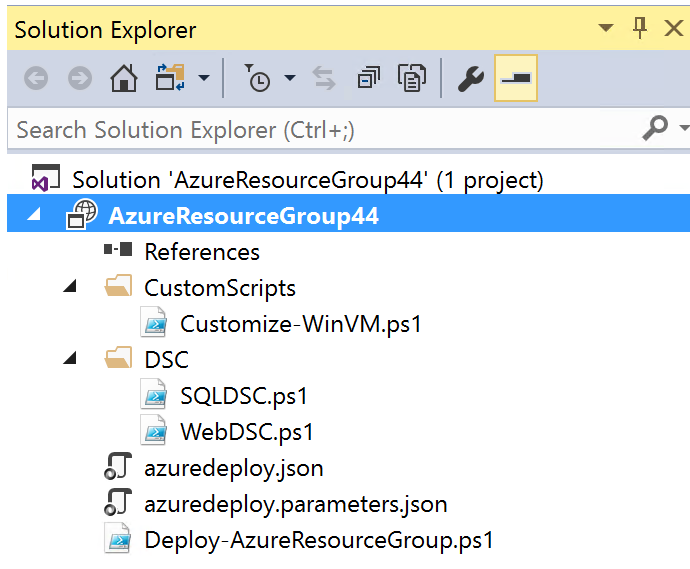
10. Browse to the folder where you extracted the "productCat-VM-ARM-Deploy" files. Click through the subfolders until you are at the folder showing **AzureResourceGroup44 Microsoft Visual Studio Project file type** (in our setup, this is c:\ProductCat-VM-ARM-deploy\ARM-Template-WebandSQL-finalversion)



11. **Confirm** to open this project by pressing the **Open** button. This loads the project in Visual Studio.
12. Visual Studio will throw a security warning popup message; this is to warn you to only open Projects from trusted locations. **Press** the **Ok button** to continue.



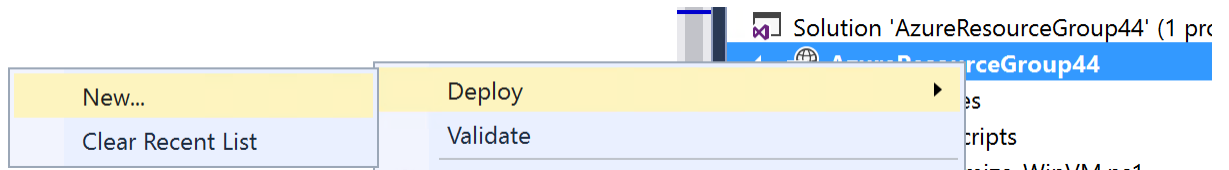
13. Once the project is opened in Visual Studio, you should have the Solution Explorer to the right of the screen, showing the actual deployment project folder and file structure.



14. In short, these files are doing the following:

File	Purpose
Azuredeploy.json	The actual ARM-template deployment file, which creates the different Azure Resources for both WebVM and SQLVM infrastructure.
Azuredeploy.parameters.json	The ARM-template parameters file
\CustomScripts\Customize-WinVM.ps1	A PowerShell script, containing specific settings that get applied to both VMs using PowerShell
DSC\SQLDSC.ps1	A PowerShell script that is used to customize the installation and configuration of SQL Server on the SQLVM
DSC\WebDSC.ps1	A PowerShell script that is used to customize the installation and configuration of IIS Web Server on the WebVM
Deploy-AzureResourceGroup.ps1	A PowerShell script that is used by VS2017 to run the actual deployment of the ARM-template

15. From within the Solution Explorer window, select the **AzureResourceGroup44** project, right-click it and from the context menu, select **Deployment / New...**



16. In the appearing "Deploy to Resource Group" popup, complete the following settings:

- Subscription: **Your Azure Subscription**
- Resource Group: **Create New / SUFFIX-VMs** – location = **closest by to your location**
- Deployment template: **azuredeploy.json**

- Template Parameters File: `azuredeploy.parameters.json`

The screenshot shows the 'Deploy to Resource Group' dialog box. It contains the following fields and buttons:

- Microsoft account:** info@pdtit.be
- Subscription:** Microsoft Az...
- Resource group:** ADS-VMs (East US)
- Deployment template:** azuredeploy.json
- Template parameters file:** azuredeploy.parameters.json
- Artifact storage account:** stage0a
- Buttons:** Deploy, Cancel, and Edit Parameters... (highlighted with a red rectangle)

Below the fields, there is a link: [How do I deploy project artifacts with an Azure deployment template ?](#)

17. Before pressing the Deploy button, complete some additional deployment settings by pressing the Edit Parameters button:



Edit Parameters
✕

The following parameter values will be used for this deployment:


Parameter Name	Value
vmstorageType	Premium_LRS
WebVMName	WebVM
WebVMAdminUserName	labadmin
WebVMAdminPassword	••••••••••••••••
WebVMWindowsOSVersion	2012-R2-Datacenter
WebPublicIPDnsName	adscontainers2309
_artifactsLocation	<Auto-generated>
_artifactsLocationSasToken	<Auto-generated>
WebPackage	http://pdtitlabsstorage.blob.core.windows.net/templates/WebVMsite/WebVM
SQLVMName	SQLVM
SQLVMAdminUserName	labadmin
SQLVMAdminPassword	••••••••••••••••
SQLVMSKU	Standard

☒ Save passwords as plain text in the parameters file

Save
Cancel

- WebVMName: WebVM
  - WebVMAdminUserName: labadmin
  - WebVMAdminPassword: [L@BadminPa55w.rd](#) (do not alter this password, as otherwise the customization script later on won't work)
  - WebVMWindowsOSVersion: 2012-R2-Datacenter
  - WebPublicIPDnsName: SUFFIXcontainersDATE
  - SQLVMName: SQLVM
  - SQLVMAdminUsername: labadmin
  - SQLVM WebVMAdminPassword: [L@BadminPa55w.rd](#) (do not alter this password, as otherwise the customization script later on won't work)
18. **Check** the "Save passwords as plain text in the parameters file". (Note: This is ok in this lab environment, but not recommended in production deployments. If this option is not checked, you will get a PowerShell window appearing, asking you for this administrator password there).
19. Once all settings have been completed in the Parameters popup window, click **Save**. You are redirected to the "Deploy to Resource Group" window. Start the actual deployment by pressing the **Deploy** button.

Deploy to Resource Group
✕



Microsoft account
▼

info@pdtit.be

Subscription:

Microsoft Az
▼

Resource group:

ADS-VMs (East US)
▼

Deployment template:

azuredeploy.json
▼

Template parameters file:

azuredeploy.parameters.json
▼

Edit Parameters...

Artifact storage account: ⓘ

stage0a
▼

[How do I deploy project artifacts with an Azure deployment template ?](#)

Deploy

Cancel

20. The Azure Resources deployment kicks off, which can be followed from the Visual Studio Output window. (For your info, this deployment takes about 15-20min might be a good time for a break ☺).

```

21:04:07 - LastModified      : 9/23/2018 9:04:07 PM +00:00
21:04:07 - SnapshotTime     :
21:04:07 - ContinuationToken :
21:04:07 - Context          : Microsoft.WindowsAzure.Commands.Common.Storage.LazyAzureStorageContext
21:04:07 - Name              : DSC/WebDSC.zip
21:04:07 -
21:04:08 - VERBOSE: Performing the operation "Replacing resource group ..." on target "".
21:04:17 - VERBOSE: 9:04:09 PM - Created resource group 'ADS-VMs' in location 'eastus'
21:04:17 -
21:04:17 - ResourceGroupName : ADS-VMs
21:04:17 - Location          : eastus
21:04:17 - ProvisioningState : Succeeded
21:04:17 - Tags              :
21:04:17 - TagsTable         :
21:04:17 - ResourceId        : /subscriptions/0a407898-c077-442d-8e17-71420aa82426/resourceGroups/ADS-VMs
21:04:17 -
21:04:17 - VERBOSE: Performing the operation "Creating Deployment" on target "ADS-VMs".
21:04:17 - VERBOSE: 9:04:13 PM - Template is valid.
21:04:17 - VERBOSE: 9:04:15 PM - Create template deployment 'azuredeploy-0923-2104'
21:04:17 - VERBOSE: 9:04:15 PM - Checking deployment status in 5 seconds
21:04:20 - VERBOSE: 9:04:20 PM - Checking deployment status in 10 seconds
21:04:30 - VERBOSE: 9:04:30 PM - Resource Microsoft.Network/virtualNetworks 'AzTrainingVNet' provisioning status is
21:04:30 - VERBOSE: 9:04:30 PM - Resource Microsoft.Network/publicIPAddresses 'WebPublicIP' provisioning status is
21:04:30 - VERBOSE: 9:04:30 PM - Resource Microsoft.Storage/storageAccounts 'vmstoragex62liq2htl26w' provisioning

```

21. The different Azure Resources **get deployed**; from your **internet browser**, connect to <http://portal.azure.com>, **authenticate** with your Azure subscription credentials. **Go to Resource Groups**, open the **SUFFIXcontainersDATE Resource Group**. Here, you can see the different resources getting created.

The screenshot shows the Azure portal interface for the 'ADS-VMs' Resource group. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Events, Settings, Quickstart, Resource costs, Deployments, Policies, Properties, Locks, Automation script, Monitoring, and Insights (preview). The main content area displays the 'Overview' tab, showing the Subscription (Microsoft Azure Sponsorship), Subscription ID (0a407898-c077-442d-8e17-71420aa82426), and 1 Deploying deployment. Below this, there are filters for 'Filter by name...', 'All types', 'All locations', and 'No grouping'. A table lists 7 items:

NAME	TYPE	LOCATION
AzTrainingVNet	Virtual network	East US
SQLVM	Virtual machine	East US
SQLVMNetworkInterface	Network interface	East US
vmstoragex62liq2htl26w	Storage account	East US
WebPublicIP	Public IP address	East US
WebVM	Virtual machine	East US
WebVMNetworkInterface	Network interface	East US

22. From the **Resource Group** blade, **Settings** section, click **Deployments**.

23. This **shows** the actual running deployment task.

The screenshot shows the 'ADS-VMs - Deployments' blade in the Azure portal. The left sidebar contains navigation links for Overview, Activity log, and Access control (IAM). The main content area displays the 'Deployments' tab, showing a table with deployment tasks:

DEPLOYMENT NAME	STATUS	LAST MODIFIED	DURATION
azuredeploy-0923-2104	Deploying	9/23/2018, 5:04:55 PM	7 minutes 28 seconds

24. Click the deployment name <e.g. azuredeploy-0923-2104>, which shows you more details about the actual deployment process, including the already deployed resources.

Home > Resource groups > ADS-VMs - Deployments > azuredeploy-0923-2104 - Overview

## azuredeploy-0923-2104 - Overview

Deployment

Search (Ctrl+/)

Delete Cancel Redeploy Refresh

**Overview**

- Outputs
- Inputs
- Template

### Your deployment is underway

Check the status of your deployment, manage resources, or troubleshoot deployment issues. Pin this page to your dashboard to easily find it next time.

Deployment name: azuredeploy-0923-2104  
Subscription: [Microsoft Azure Sponsorship](#)  
Resource group: [ADS-VMs](#)

**DEPLOYMENT DETAILS** ([Download](#))

Start time: 9/23/2018, 5:04:55 PM  
Duration: 7 minutes 3 seconds  
Correlation ID: ce2c219d-9a4f-4be2-9399-08f027317f46

RESOURCE	TYPE	STATUS	OPERATION DETAILS
SQLVM/Microsoft.Pow	Microsoft.Compute/...	Created	<a href="#">Operation details</a>
SQLVM/Customize-Wi	Microsoft.Compute/...	Created	<a href="#">Operation details</a>
WebVM/Microsoft.Pow	Microsoft.Compute/...	Created	<a href="#">Operation details</a>
WebVM/Customize-W	Microsoft.Compute/...	Created	<a href="#">Operation details</a>
SQLVM	Microsoft.Compute/...	OK	<a href="#">Operation details</a>
WebVM	Microsoft.Compute/...	OK	<a href="#">Operation details</a>
vmstoragex62liq2htl2f	Microsoft.Storage/st...	OK	<a href="#">Operation details</a>

25. Wait for the deployment to complete successful. This is noticeable from within the Visual Studio Output window, or from within the Azure Portal deployment blade you were in before.

**Output**

Show output from: ADS-VMs

21:16:49 - sqlvmAdminPassword SecureString  
21:16:49 - sqlvmSKU String Standard  
21:16:49 -  
21:16:49 - Outputs : {}  
21:16:49 - OutputsString :  
21:16:49 -  
21:16:49 -  
21:16:49 -  
21:16:49 - Successfully deployed template 'azuredeploy.json' to resource group 'ADS-VMs'.

## azuredeploy-0923-2104 - Overview

Deployment

Overview

Outputs

Inputs

Template

Delete
Cancel
Redeploy
Refresh

✓ Your deployment is complete

Check the status of your deployment, manage resources, <br/>
Pin this page to your dashboard to easily find it next time.

Deployment name: azuredeploy-0923-2104  
Subscription: [Microsoft Azure Sponsorship](#)  
Resource group: [ADS-VMs](#)

26. Close Visual Studio without saving changes to the project.

To verify all went fine during the deployment of the Azure Resources, as well as the customization and configuration using PowerShell Desired State Configuration, log on to the WebVM to validate the web application is running as expected.

27. From within the **Azure Portal**, go to **Resource Groups**, and select the Resource Group where you deployed the VMs. In here, select the WebVM Virtual Machine by clicking on it. This opens the WebVM detailed blade.

Home > Resource groups > ADS-VMs > WebVM

WebVM

Virtual machine

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Disks

Size

Connect
Start
Restart
Stop
Move
Delete
Refresh

WebVM is not using Managed Disks. Migrate to Managed Disks to get more benefits.

Resource group (change)  
ADS-VMs

Status  
Running

Location  
East US

Subscription (change)  
Microsoft Azure Sponsorship

Subscription ID  
0a407898-c077-442d-8e17-71420aa82426

Computer name  
WebVM

Operating system  
Windows

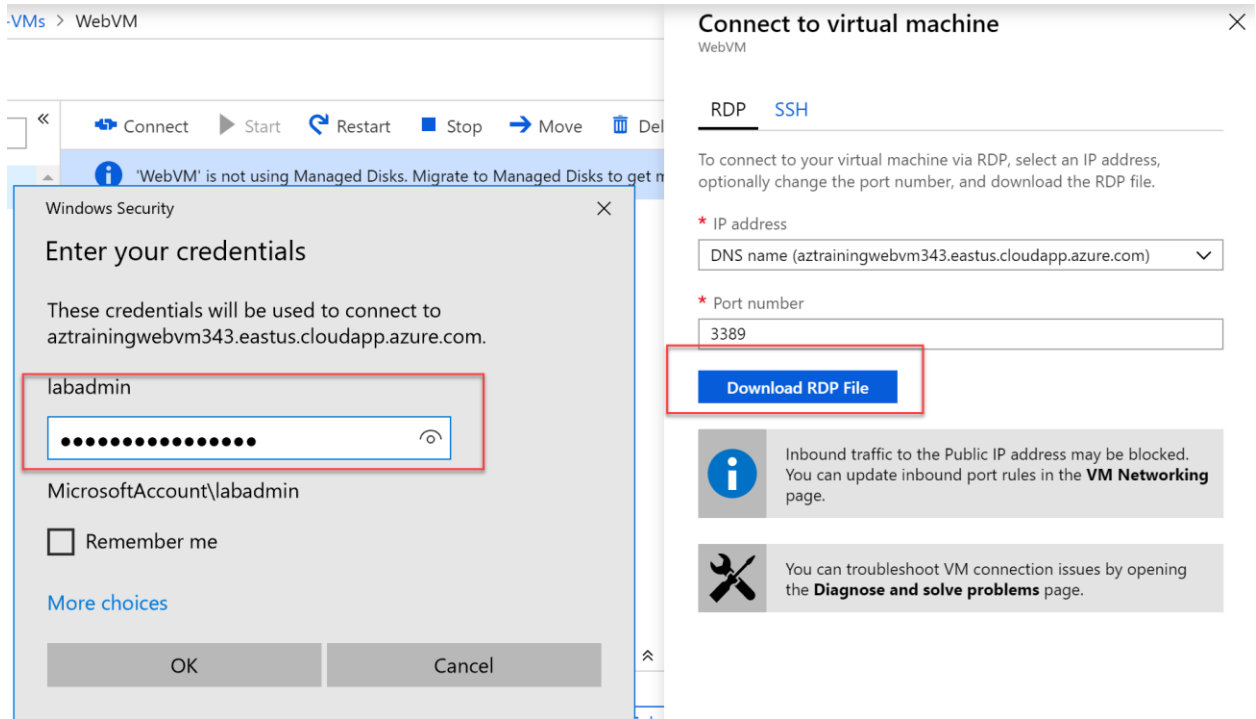
Size  
Standard\_DS1\_v2 (1 vcpus, 3.5 GB memory)

Public IP address  
13.68.193.87

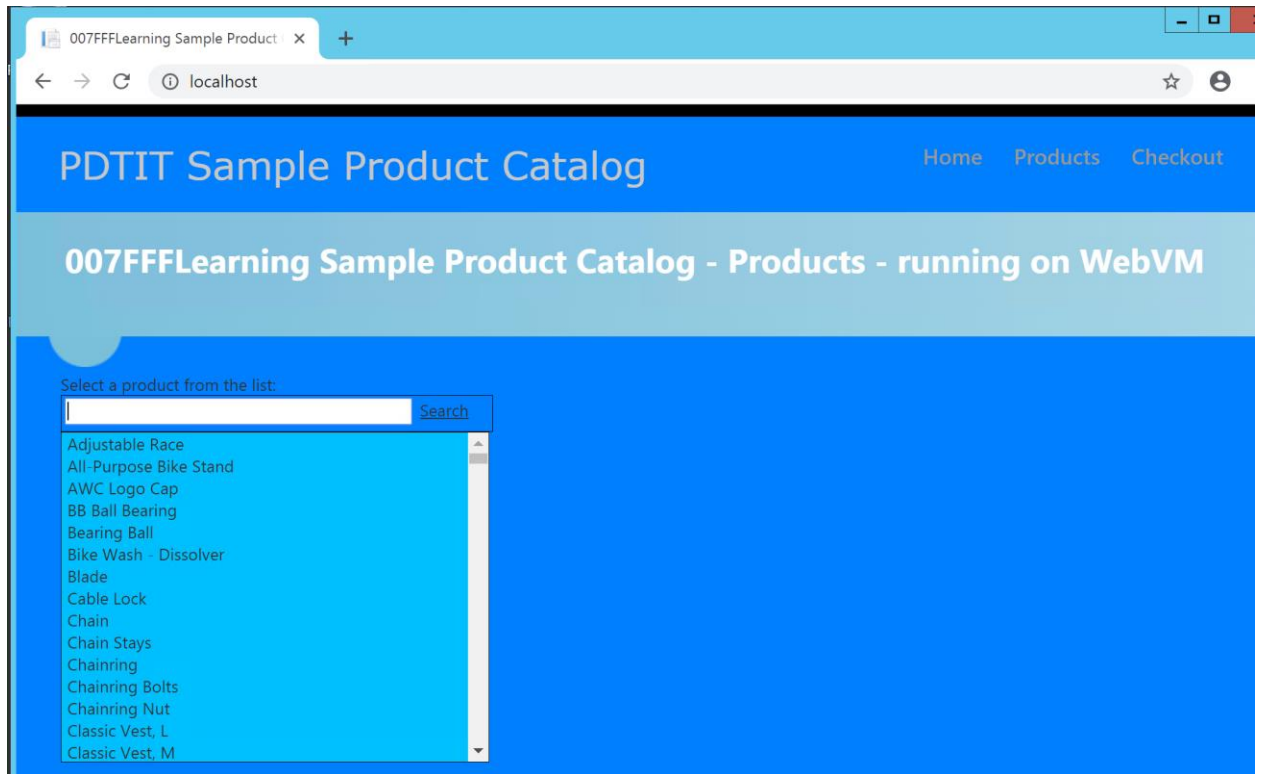
Virtual network/subnet  
AzTrainingVNet/FrontendNetwork

DNS name  
aztrainingwebvm343.eastus.cloudapp.azure.com

28. Similar to what you did with the lab-JumpVM, press the **Connect** button, to open the Remote Desktop session to this WebVM Virtual Machine.



29. Here, log on with the credentials from the ARM template (labadmin / [L@BadminPa55w.rd](#)) unless you changed those before the deployment.
30. From within the WebVM RDP-session, open an internet browser, and browse to <http://localhost>. This opens the Product Catalog web application, establishing a connection to the SQLVM to connect to the underlying SQL database.



31. Close the browser session on the WebVM.

32. Close the RDP session for the WebVM Virtual Machine.

This completes the task in which you deployed Azure Resources using Visual Studio 2017 ARM-template with customizations, and validated the good functioning of the web application.

## Summary

In this lab, you started with deploying an ARM-template from within the Azure Portal, deploying a lab-JumpVM Virtual Machine in Azure. In the next task, you learned how to deploy a more complex Azure environment, again using an ARM-template, where deployment was executed from within Visual Studio 2017.