DP070: Migrate Open Source Workloads to Azure

Microsoft® Hyper-V Classroom Setup Guide

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**Microsoft Learning Azure Pass**

Some demonstrations and labs in this course require access to Microsoft Azure. As such you need to request Microsoft Learning Azure passes for you and your students. Once students receive the Microsoft Learning Azure passcodes, they then need to register and activate their pass prior to the class starting.

**Note:** You should request the Microsoft Learning Azure passes at least two weeks prior to the class to allow sufficient time for their arrival.

Details of how to acquire Microsoft Learning Azure passes for your class, along with pass functionality are available at <http://aka.ms/mocazurepass>.

Students should activate their Microsoft Learning Azure Passes prior to the start of class by going to <http://www.microsoftazurepass.com/learning> and following the outlined steps.

While using publicly available trial subscriptions or other types of passes is possible with the course labs, the labs have not been tested with every available pass type, so variations in functionality, while unlikely, are possible due to potential Azure subscription limitations. The scripts used in the labs will also delete any existing services or components present in Microsoft Azure under the subscription that you use. As such, using the Microsoft Learning Azure Pass will provide a level of standardization and help prevent any inadvertent removal or interference with existing Microsoft Azure infrastructure.

# Introducing Microsoft Hyper-V

This learning product is designed using Microsoft® Hyper-V running on Windows Server 2016 RTM. Hyper-V is a virtualization technology that allows a single computer to act as a host for one or more virtual machines. The virtual machines use a set of virtual devices that might or might not map to the physical hardware of the host computer.

The software that is installed onto the virtual machine is unmodified, full-version, retail software that operates exactly as it does when it is installed onto physical hardware.

The following definitions will help you with the remainder of this document:

* **Hyper-V**: Hyper-V is a server application that enables users to run a broad range of operating systems simultaneously on a single physical server.
* **Host Computer**: The physical computer onto which an operating system and the Hyper-V server role have been installed.
* **Host Operating System**: The operating system that is running on the physical computer. For this course, the only supported host operating system is Windows Server 2016.
* **Virtual Machine**: The computer that is running inside Hyper-V. In this document, “Hyper-V” refers to the application running on the host, while “virtual machine” refers to the guest operating system and any software that is running inside the Hyper-V application.
* **Guest Operating System**: The operating system that is running inside the virtual machine.

Note:Pressing CTRL+ALT+DELETE while working with a virtual machine will display the Windows Security dialog box for the host operating system. To close the dialog box, press ESC. To access the Windows Security dialog box for a guest operating system, press CTRL+ALT+END. Other than this difference, software on a virtual machine behaves as it would behave on a physical computer.

You can configure virtual machines to communicate with the host computer, other virtual machines on the same host computer, other host computers, virtual machines on other host computers, other physical computers on the network, or any combination thereof.

The setup instructions that you will follow as part of this classroom setup guide configure Hyper-V and the Virtual Machines that run on the host. Changing any of the configuration settings may render the labs for this learning product unusable.

# Setup Overview

The host computers must be set up with Windows Server 2016 and must be running on 64-bit hardware. For more information on the supported hardware for Hyper-V, please see the follow web site: http://www.microsoft.com/hyper-v.

For the purposes of this learning product, it is not necessary for the host computers to be able to communicate with another network. However, allowing them to communicate with each other is recommended to make setup easier. The setup procedures below assume that the host computers can communicate with each other for setup purposes. You should note the administrator’s user name and password for the host computers and provide this information to the instructor.

# Classroom Requirements

This learning product requires a classroom with a minimum of one computer for the instructor and one for each student. Before class begins, use the following information and instructions to install and configure all computers.

## Hardware

The classroom computers require the following hardware and software configuration.

**Hardware Level 8**

* Processor\*: 2.8 GHz 64-bit processor (multi-core) or better
  + \*\*AMD:
    - AMD Virtualization (AMD-V)
    - Second Level Address Translation (SLAT) - nested page tables (NPT)
    - Hardware-enforced Data Execution Prevention (DEP) must be available and enabled (NX Bit)
    - Supports TPM 2.0 or greater
  + \*\*Intel:
    - Intel Virtualization Technology (Intel VT)
    - Supports Second Level Address Translation (SLAT) – Extended Page Table (EPT)
    - Hardware-enforced Data Execution Prevention (DEP) must be available and enabled (XD bit)
    - Supports TPM 2.0 or greater
* Hard Disk: 500GB SSD System Drive
* RAM: 32 GB minimum
* Network adapter
* Monitor: Dual monitors supporting 1440 X 900 minimum resolution
* Mouse or compatible pointing device
* Sound card with headsets

In addition, the instructor computer must:

* Be connected to a projection display device that supports SVGA 1024 x 768 pixels, 16 bit colors.
* Have a sound card with amplified speakers

\***Note:** To determine what features your processor supports, download Coreinfo from <http://aka.ms/coreinfo>

\*\***Important**: To support courses that use Nested Virtualization, you must use the Intel specs above. AMD processors do not currently support Hyper-V Nested Virtualization.

## Software

Please note that, unless otherwise indicated, this software is not included in the Trainer Materials disc. This learning product was developed and tested on supported Microsoft software, which is required for the classroom computers.

Also required, but not included in the Training Materials: Microsoft Office PowerPoint® 2007 (instructor computer only).

# Classroom Configuration

Each classroom computer will serve as the host for one virtual machine that will run in Hyper-V. After completion of the setup, all computers will be configured to run the virtual machine named LON-DEV-01.

#### Estimated Time to Set up the Classroom: 60 Minutes

# Instructor Computer Checklist

* 1. Install the Hyper-V Server Role
* 2. Create Virtual Switch
* 3. Install the Virtual Machine Files
* 4. Create a Setup Share
* 5. Copy the Virtual Machine Files to the Student Computer
* 6. Import the Virtual Machines on the Instructor Computer
* 7. Change Hyper-V checkpoints to standard checkpoints
* 8. Configure the Virtual Machines on the Instructor Computer
* 9. Install the PowerPoint Slides. (if needed)
* 10. Install Adobe Flash (if needed)
* 11. Install Adobe Reader (if needed)

# Instructor Computer Setup

Use the instructions in the following section to set up the classroom manually. Before starting the installation of the instructor computer, a supported operating system and Microsoft Office PowerPoint® 2007 must be installed on the computer.

**Important:** The operating systems installed on the virtual machines in this learning product have **not** been activated, and each virtual machine is in the Notification state.

As stated earlier, you must activate the Windows 10 client virtual machines for each of the steps outlined below. However, you do not need to activate the Windows Server 2016 virtual machines, but you will, at a minimum, need to apply a grace period by running **slmgr -rearm** at the administrative command prompt and then restarting. This gives a ten-day grace period before the virtual machine returns to the notification mode and subsequent hourly shutdowns. You can view the number of rearms available in the virtual machines by running the command **slmgr -dlv**. If an extended period is required, it is also possible to activate the server virtual machines for 180 days.

You do not require a product key to activate the server virtual machines because they are pre-keyed and can be activated automatically by placing them online or activating them over the phone. Once that initial 180-day activation period has expired, you can obtain a second 180-day activation period by running **slmgr -rearm**, restarting, and then activating the virtual machine as outlined earlier.

You can obtain additional context and details on activation states from the Born To Learn website at: <http://aka.ms/moclabkey>

In addition, when the virtual machine is started for the first time you might be prompted to restart the computer. This is because of the hardware differences on the host computer. You can restart, or you can click Restart Later to close the message.

1.

## 1. Install the Hyper-V Server Role

In this task, you will install the Hyper-V server role on the Windows Server 2016 host computer.

Important:If Hyper-V is already installed, you can skip this procedure.

1. In the Server Manager console, on the **Manage** menu, click **Add Roles and Features**.
2. On the **Before you begin** page of the Add Roles and Features Wizard, click **Next**.
3. On the **Select installation type** page, select **Role-based or feature-based installation**, and then click **Next**.
4. On the **Select destination server** page, ensure that the local computer is selected, and then click **Next**.
5. On the **Select** **Server Roles** page, select **Hyper-V**.
6. In the **Add Roles and Features Wizard** dialog box, click **Add Features**.
7. On the **Select Server Roles** page of the Add Roles and Features Wizard, click **Next**.
8. On the **Select features** page, click **Next**.
9. On the **Hyper-V** page, click **Next**.
10. On the **Create** **Virtual Switches** page, verify that no selections have been made, and then click **Next**.
11. On the **Virtual Machine Migration** page, click **Next**.
12. On the **Default Stores** page, review the location of **Default Stores**, and then click **Next**.
13. On the **Confirm Installation Selections** page, select **Restart the destination server automatically if required**.
14. In the **Add Roles and Features Wizard** dialog box, review the message about automatic restarts, and then click **Yes**.
15. On the **Confirm Installation Selections** page, click **Install**.
16. Ensure that you restart the machine.
17. After the final restart, log on using administrator credentials.

## 2. Create Virtual Switch

This section creates the virtual switches for this learning product.

1. In **Server Manager**, click **Tools**, and then click **Hyper-V Manager**.
2. In **Hyper-V Manager**, click the local computer, and then on the **Actions** pane, click **Virtual Switch Manager**.
3. In the **Virtual Switch Manager** dialog box, select **New virtual network switch**. Ensure that **Private** is selected, and then click **Create Virtual Switch**.
4. In the **Virtual Switch Properties** area of the **Virtual Switch Manager** dialog box, specify the following information, and then click **OK**:

* Name: **Private Network**
* Connection type: **Private network**

## 3. Install the Virtual Machine Files

After installing the Hyper-V server role, you will need to follow the following steps to copy the base images, middle tiers and virtual machine files to the server and then configure the virtual machines.

**Extract the Course Images**

**To Extract the Virtual Machines:**

1. From the courseware source files location, double-clickDP070**-LON-DEV-01.exe**.
2. In the **Official Microsoft Learning Product License Terms** window, click **Accept** to indicate that you accept the terms in the license agreement.
3. In the **WinRAR self-extracting archive** window, in the **Destination folder** box, ensure that **C:\Program Files\Microsoft Learning\DP070\Drives** is listed, and then click **Extract**.

Note: After completing the extraction of all of the classroom files, you should have the following files installed.

| **File** | **In folder** |
| --- | --- |
| DP070-LON-DEV-01.vhd | C:\Program Files\Microsoft Learning\DP070\Drives\DP070-LON-DEV-01\Virtual Hard Disks |
| <GUID>.vmcx | C:\Program Files\Microsoft Learning\DP070\Drives\DP070-LON-DEV-01\Virtual Machines |
| <GUID>.VMRS | C:\Program Files\Microsoft Learning\DP070\Drives\DP070-LON-DEV-01\Virtual Machines |

## 4. Create a Setup Share

In this task, you will share virtual machine files for copying to student computers.

* Share the **C:\Program Files\Microsoft Learning\DP070\Drives** folder using a share name of **DP070\_Drives**.

## 5. Copy the Virtual Machine Files to the Student Computer

Note: You must perform the file copy prior to importing the virtual machines. Once you import the virtual machines, you will not be able to import them again.

1. Copy all of the files from the **DP070\_Drives** share on the instructor computer to **C:\Program Files\Microsoft Learning\DP070\Drives**.

**Note:** Ensure that all files are copied.

* C:\Program Files\Microsoft Learning\DP070 and all included folders and files
* C:\Program Files\Microsoft Learning\Base

1. Ensure that you have copied the files using a permission retaining software such as RoboCopy or XCopy.
2. Check that all permissions have been retained, by looking at the directories above and making sure they are not **Read-Only**.
3. Add the virtual machines to the Hyper-V management console. For detailed instructions see the instructor computer setup.

## 6. Import the Virtual Machines on the Instructor Computer

1. On the Instructor computer, on the host machine, click **Start**, point to **Administrative Tools**, and click **Hyper-V Manager**.
2. In the **Actions** pane, click **Import Virtual Machine**.
3. In the **Import Virtual Machine** dialog box, on the **Before You Begin** page, click **Next**.
4. In the **Import Virtual Machine** dialog box, click **Browse**.
5. Browse to **C:\Program Files\Microsoft Learning\DP070\Drives**, click **DP070-LON-DEV-01**, click **Select Folder**, and then click **Next**.
6. In the **Select Virtual Machine** dialog box, click **Next**.
7. In the **Choose Import Type** dialog box, ensure **Register the virtual machine in-place (use the existing unique ID)** selected, and then click **Next**.
8. In the **Complete Import Wizard**, click **Finish**.

## 7. Change Hyper-V checkpoints to standard checkpoints

This section changes the default productions checkpoints to standard checkpoints. If this has already been done, you can skip this section.

1. In **Hyper-V Manager**, right-click the virtual machine, and then click **Settings**.
2. Under the **Management** section, select **Checkpoints**.
3. Select **standard checkpoints**.
4. Click **Apply** to save your changes, and then click **OK**.

## 8. Configure the Virtual Machines on the Instructor Computer

#### Start the Virtual Machine

1. Right-click **DP070-LON-DEV-01**, and click **Start**.
2. Right-click **DP070-LON-DEV-01**, and click **Connect**.
3. Verify that the computer boots. Log on as **azureuser**, using a password of **Pa55w.rd**. Verify that the logon is successful.

#### Configure Network Settings in the Virtual Machine

1. On the Desktop, in the top right corner, click the drop-down arrow, click **Wired Connected**, and then click **Wired Settings**.
2. In the **Network** dialog box, in the **Wired** section, click the cog icon.
3. In the **Wired** dialog box, on the **Details** tab, ensure the **Make available to other users** check box is cleared.
4. On the **IPv4** tab, ensure the details are as follows, and then click **Apply**:
   * **IPv4 Method**: Manual
   * **Addresses**:
     + **Address**: 172.16.0.20
     + **Gateway**: 172.16.0.1
   * **DNS**: *A valid DNS account for your network*
5. Close the **Network** dialog box.

#### Install Databases

1. On the Desktop, click **Show Applications**, scroll down, and then click **Terminal**.
2. In the Terminal, at the prompt, type the following command, and then press Enter:

sudo bash

1. At the **Password** prompt, type **Pa55w.rd**, and then press Enter.
2. In the Terminal, at the prompt, type the following command, and then press Enter:

git clone https://github.com/MicrosoftLearning/DP-070-Migrate-Open-Source-Workloads-to-Azure workshop

1. At the prompt, type the following command, and then press Enter:

cd ~/workshop/migration\_samples/setup/mysql/northwind

1. At the prompt, type the following command, and then press Enter:

sudo mysql < create\_user.sql

1. At the prompt, type the following command, and then press Enter:

mysql --user=azureuser --password=Pa55w.rd < northwind.sql

1. At the prompt, type the following command, and then press Enter:

cd ~/workshop/migration\_samples/setup/mysql/adventureworks

1. At the prompt, type the following command, and then press Enter:

mysql --user=azureuser --password=Pa55w.rd < adventureworks.sql

1. At the prompt, type the following command, and then press Enter:

cd ~/workshop/migration\_samples/setup/postgresql/northwind

1. At the prompt, type the following command, and then press Enter:

su postgres

1. At the prompt, type the following command, and then press Enter:

psql

1. At the prompt, type the following command, and then press Enter:

create role azureuser with login;

1. At the prompt, type the following command, and then press Enter:

alter role azureuser createdb;

1. At the prompt, type the following command, and then press Enter:

alter role azureuser password 'Pa55w.rd';

1. At the prompt, type the following command, and then press Enter:

alter role azureuser superuser;

1. At the prompt, type the following command, and then press Enter:

\q

1. At the prompt, type the following command, and then press Enter:

exit

1. At the prompt, type the following command, and then press Enter:

su azureuser

1. At the prompt, type the following command, and then press Enter:

cd ~/workshop/migration\_samples/setup/postgresql/northwind

1. At the prompt, type the following command, and then press Enter:

dropdb --if-exists northwind

1. At the prompt, type the following command, and then press Enter:

createdb northwind

1. At the prompt, type the following command, and then press Enter:

psql northwind < northwind.sql

1. At the prompt, type the following command, and then press Enter:

cd ~/workshop/migration\_samples/setup/postgresql/adventureworks

1. At the prompt, type the following command, and then press Enter:

dropdb --if-exists adventureworks

1. At the prompt, type the following command, and then press Enter:

createdb adventureworks

1. At the prompt, type the following command, and then press Enter:

psql adventureworks < adventureworks.sql

1. At the prompt, type the following command, and then press Enter:

exit

1. At the prompt, type the following command, and then press Enter:

exit

1. At the prompt, type the following command, and then press Enter:

exit

#### Configure pgAdmin

1. In the favorites bar, click the **pgAdmin4** icon.
2. In the **Set Master Password** dialog box, type **Pa55w.rd**, and then click **OK**.
3. In the **Browser** pane, right-click **Servers**, point to **Create**, and then click **Server**.
4. In the **Create - Server** dialog box, on the **General** tab, in the **Name** box, type **LON-DEV-01**.
5. On the **Connection** tab, in the **Host name/address** box, type **127.0.0.1**.
6. In the **Username** box, type **azureuser**.
7. In the **Password** box, type **Pa55w.rd**, select the **Save password?** check box, and then click **Save**.
8. Close pgAdmin4.

#### Configure MySQL Workbench

1. In the favorites bar, click the **MySQL Workbench** icon.
2. On the **Database** menu, click **Manage Connections**.
3. In the **Manage Server Connections** dialog box, click **New**.
4. In the **Connect Name** box, type **LON-DEV-01**.
5. On the **Connection** tab, in the **Username** box, type **azureuser**.
6. Next to **Password**, click **Store in** **Keychain**.
7. In the **Store Password for Connection** dialog box, in the **Password** box, type **Pa55w.rd**, and then click **OK**.
8. In the **Manage Server Connections** dialog box, click **Test Connection**.
9. In the **Successfully made the MySQL connection** dialog box, click **OK**.
10. In the **Manage Server Connections** dialog box, click **Close**.
11. Close MySQL Workbench.
12. In the favorites bar, click the **MySQL Workbench** icon.
13. Under **MySQL Connections**, ensure that **LON-DEV-01** is visible, and then close MySQL Workbench.

#### Create a checkpoint

1. Under **Virtual Machines**, right-click **DP070-LON-DEV-01**, and then click **Checkpoint**.
2. Wait for the Checkpoint process to finish.
3. In the **Checkpoint** pane, right-click the checkpoint name, and then click **Rename**.
4. Type **StartingImage**, and then press Enter.

## 9. Install the PowerPoint Slides

Install the PowerPoint slides for the learning product by extracting the files included in:

* -MCT-Only-PowerPoint.exe

## 10. Install Adobe Flash (if needed)

In this task, you will install Adobe Flash by running the installation file.

Note:You must download the installation file for Adobe Flash from <http://www.adobe.com> and copy this file to the instructor computer.

Visit the Adobe Web site at <http://www.adobe.com> to download and install the latest version.

## 11. Install Adobe Reader (if needed)

In this task, you will install Adobe Reader by running the installation file.

Note:You must download the installation file for Adobe Acrobat Reader from <http://www.adobe.com> and copy this file to the instructor computer.

Visit the Adobe Web site at <http://www.adobe.com> to download and install the latest version.

# Student Computer Checklist

* 1. Install and configure Hyper-V
* 2. Install the Virtual Machine Files

# Student Computer Setup

Use the instructions in the following section to set up the classroom manually. Before starting the installation of the student computer, a supported operating system must be installed on the computer. You can check the supported systems list at: <http://www.microsoft.com/hyper-v>.

Caution: These instructions assume network connectivity between the instructor computer and the student computers. If you do not have connectivity, Microsoft Learning recommends copying the activated virtual machines to the student computers by means of a manually created DVD or universal serial bus (USB) drive.

## 1. Install the Hyper-V Server Role

Note: If Hyper-V is already installed and configured, you can skip this procedure.

For detailed instructions see the instructor computer setup, tasks 1-3.

## 2. Install the Virtual Machine Files

Note: Ensure that all extracted courseware virtual machine files were copied from the Instructor computer during the Instructor Computer setup.

C:\Program Files\Microsoft Learning\DP070 and all included folders and files

1. Check that all permissions have been retained, by looking at the directories above and making sure they are not Read Only.
2. Add the virtual machines to the Hyper-V management console. For detailed instructions see the instructor computer setup.

# Appendix A Keyboard Layout

The virtual machines were developed using the English (United States) layout shown below.





If your physical keyboard doesn’t match the above layout, you may need to refer to the above layout for the character positions used to logon. For future logons and usage throughout the labs, you may want to install your keyboard layout in the virtual machine.