Course 10962C: Advanced Automated Administration with Windows PowerShell

Microsoft Hyper-V Classroom Setup Guide

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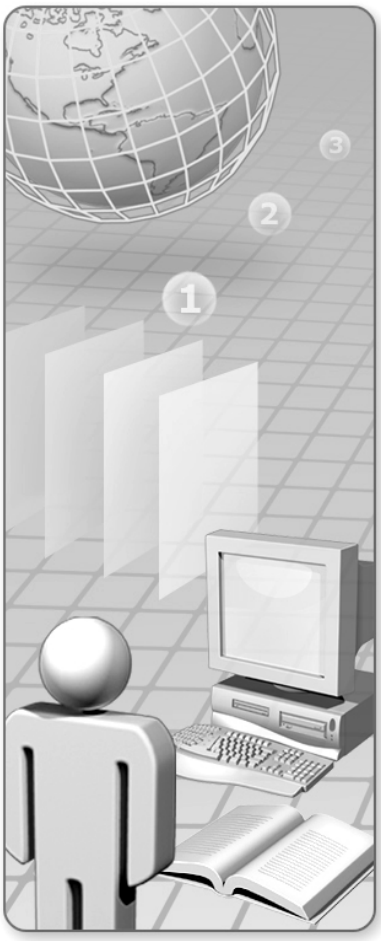

Product Number: 10962C

Microsoft Labs Online

Microsoft Labs Online (online or hosted labs) are available for this and other Microsoft Official Courseware (MOC) courses. This provides an alternative to the lab setup and configuration that is outlined in this document, where the course virtual machines are accessed on Microsoft Learning's hosted lab platform, rather than on physical local machines.

Requirement for accessing hosted labs

Hosted labs still require that each student have a host computer to access the course lab environment, but the host computer does not need to meet the same specifications as when the virtual machines are running locally.

The general requirements for student machines are as follows:

- A valid operating system such as Windows 7 or newer
- Internet Explorer, or another supported web browser
- Internet access

You should refer to your individual hosting provider for more specific details.

In addition, there may be some variations in steps for labs that are run in a hosted environment as opposed to a local environment. Details of any variations in lab steps can be found in the Lab Notes on the hosted lab platform.

If you are using hosted labs instead of on-premises labs, become familiar with how to access and configure the labs. Ensure that you are ready to demonstrate their use to students when starting the class, and that everything is in place for students to have a smooth experience.

You can purchase Microsoft Labs Online for use during course delivery at the same time you order the course materials.

Note: Some labs may not be available on the Microsoft Labs Online platform due to specific requirements in the lab steps, such as labs with a "boot to vhd" or "native boot" requirement. Therefore, you should evaluate the labs in your course before deciding whether to use local labs or Microsoft Labs Online labs.

Digital Courseware

If you are using digital courseware via the Skillpipe reader from Arvato, if the course contains a "boot to vhd" or "native boot" scenario in some or all of the labs, students will not be able to view the online courseware content and lab steps in the Skillpipe reader while their host machine is offline. In this particular scenario, use one of the following options:

1. Have two network interface cards (NICs) in the host machines.
2. Print out the Lab steps for the particular module.
3. Ask student who have their own devices to bring them to the class.
4. Configure two virtual machines prior to the class to allow access to the content offline.

Depending on your particular situation, consider implementing one of the above options. Further details and considerations for these workarounds and options are available on the Born To Learn website at http://borntolearn.mslearn.net, and have also been sent out via partner and Microsoft Certified Trainer (MCT) newsletters.

Important: Additional virtual machine configuration may be required. Therefore, you should allow enough time to assess your situation and make appropriate decisions.

Introducing Microsoft Hyper-V

Note: This setup requires Windows Server 2016 with Hyper-V. To import virtual machines successfully to Windows Server 2016 Hyper-V in you will have to run the VM-Pre-Import scripts, which will link the differencing drives to the Base and Middle-Tier images in the D:\Program Files\Microsoft Learning \10962\Drives*VirtualMachineName*\Virtual Hard Disks\ folders.

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** page for the host operating system. To close the page, press the ESC key. To access the **Windows Security** page 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 will configure Hyper-V and the virtual machines that run on the host. Changing any of the configuration settings might render the labs for this learning product unusable.

Windows 10 Virtual Machine Activation

The virtual machines that you use in this course utilize the Windows 10 operating system, which you must activate. For detailed instructions, refer to "Configure the Virtual Machines on the Instructor Computer" in this document.

For more information about this requirement, and for steps about how to obtain product keys for activation, refer to "Product Key Distribution for Activation of Windows" (for MOC lab virtual machines only) at:
http://go.microsoft.com/fwlink/?LinkId=270851

Windows Server 2016 Virtual Machine Activation

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.

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 (2 logical drives labelled C drive and d Drive)
- RAM: 32 GB minimum
- Network adapter
- Monitor: Dual monitors supporting 1440X900 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/Gkfypu.

Software

Microsoft Office PowerPoint 2007 or newer is required for the host computer only. Note, PowerPoint is not included in the Training Materials.

Classroom Configuration

Each classroom computer will serve as the host for several virtual machines that will run in Hyper-V. Domain or workgroup membership for the host computer does not matter, nor does the network configuration of the host computers. After completing setup, the host computer will be running the initial release of Windows Server 2016 and will be configured to run several virtual machines running Windows Server 2016 and Windows 10.

Estimated time to set up the classroom: 240 minutes

Instructor Computer Checklist

- ☐ 1. Install the Hyper-V Server role
- ☐ 2. Install the virtual machine files
- ☐ 3. Create virtual switches
- ☐ 4. Create a setup share
- ☐ 5. Copy the virtual machine files to the student computer
- ☐ 6. Configure the MT17B-WS2016-NAT virtual machine
- ☐ 7. Run the VM-Pre-Import script
- ☐ 8. Import the virtual machines on the instructor computer
- ☐ 9. Configure the virtual machines on the instructor computer
- ☐ 10. Install the PowerPoint slides

Instructor Computer Setup

Use the instructions in the following section to set up the classroom manually. Before starting the instructor computer installation, a supported operating system and Office Power Point 2007 (or newer) 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 you require an extended period, you can 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://borntolearn.mslearn.net/mct/general/f/482/t/321279.aspx

In addition, when the virtual machine starts 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 the computer, or you can click Restart Later to close the message.

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 installed already, 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, sign in using the administrator credentials.

2. Install the virtual machine files

After installing the Hyper-V server role, you will need to complete 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 base images:

1. From the courseware source files location, double-click **Base17C-WS16-1607.part0001.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** text box, ensure that **C:\Program Files\Microsoft Learning\Base** is listed, and then click **Extract**. Wait while the base virtual hard disk file is extracted. This might take a few minutes.
4. Repeat steps 1 through 3 for the following base drives:
   - **Base17B-W10-1607-Office2016.part01.exe**

To extract the middle tier images:

1. From the courseware source files location, double-click **MT17A-LON-DC1.part001.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** text box, ensure that **C:\Program Files\Microsoft Learning\Base\Drives** is listed, and then click **Extract**.

   Wait while the middle tier virtual hard disk file is extracted. This might take a few minutes.

To extract the virtual machines (if required for disk space, you can extract the course-specific files to a different drive providing the base images and the middle tiers are located in the default path):

1. From the courseware source files location, double-click **10962C-LON-DC1.part001.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** text box, ensure that **D:\Program Files\Microsoft Learning\10962\Drives** is listed, and then click **Extract**.
4. Repeat steps 1 through 3 for the following virtual machines:
   - **10962C-LON-CL1.part001.exe**
   - **10962C-LON-SVR1.part001.exe**
   - **10962C-scripts.exe**

Note: After extracting all of the classroom files, you should have the files in the following table installed.

File	In folder
Base17C-WS16-1607.vhd	C:\Program Files\Microsoft Learning\Base
Base17B-W10-1607-Office2016.vhd	C:\Program Files\Microsoft Learning\Base
MT17A-LON-DC1.vhd	C:\Program Files\Microsoft Learning\Base\Drives
VM-Pre-Import-10962C.ps1	D:\Program Files\Microsoft Learning\10962\Drives\
10962C_ImportVirtualMachines.ps1	D:\Program Files\Microsoft Learning\10962\Drives\
CreateVirtualSwitches.ps1	D:\Program Files\Microsoft Learning\10962\Drives\
TakeVMSnapshot.ps1	D:\Program Files\Microsoft Learning\10962\Drives\
10962C-LON-DC1.vhd 10962C-LON-DC1-Allfiles.vhd	D:\Program Files\Microsoft Learning\10962\Drives\10962C-LON-DC1\Virtual Hard Disks
10962C-LON-CL1.vhd 10962C-LON-CL1-Allfiles.vhd	D:\Program Files\Microsoft Learning\10962\Drives\10962C-LON-CL1\Virtual Hard Disks
10962C-LON-SVR1.vhd	D:\Program Files\Microsoft Learning\10962\Drives\10962C-LON-SVR1\Virtual Hard Disks

3. Create virtual switches

This section creates the virtual switches for this learning product.

1. Browse to **D:\Program Files\Microsoft Learning\10962\Drives**.
2. Right-click **CreateVirtualSwitches.ps1**, and then click **Run with PowerShell**. Press Y, and then press Enter if prompted.
3. Start **Hyper-V Manager**, and then click **Virtual Switch Manager**.
4. In the **Virtual Switches** area of the **Virtual Switch Manager** dialog box, verify the following virtual switch, and then click **Cancel**:
   - Name: **Private Network**

4. Create a setup share

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

1. Share the **C:\Program Files\Microsoft Learning\Base** folder using a share name of **Base_Drives**.
2. Share the **D:\Program Files\Microsoft Learning\10962\Drives** folder using a share name of **10962C_Drives**.

Note: For information about how to set up a share in Windows Server 2016, see the topic "Share a Resource" in Windows Help and Support.

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. From the student computer, copy all of the files from the **Base_Drives** share on the instructor computer to **C:\Program Files\Microsoft Learning\Base**.
2. Copy all of the files from the **10962C_Drives** share on the instructor computer to **D:\Program Files\Microsoft Learning\10962\Drives**.

Note: Ensure that all files are successfully copied:

D:\Program Files\Microsoft Learning\10962 and all included folders and files

C:\Program Files\Microsoft Learning\Base

3. Ensure that you have copied the files using a permission-retaining software such as RoboCopy or XCopy.
4. Verify that all permissions have been retained by looking at the directories above and ensuring that they are not set to **Read-Only**.
5. Add the virtual machines to the Hyper-V management console. For detailed instructions see **Instructor Computer Setup** in this document.

6. Configure the MT17B-WS2016-NAT virtual machine

MT17B-WS2016-NAT is used for activation and for Internet access when needed for specific labs.

1. Set up the **MT17B-WS2016-NAT** virtual machine. The **MT17B-WS2016-NAT** virtual machine and its related Setup guide can be downloaded from the MCT Download Center in the Base Virtual Hard Disks – Mid-Tiers (ENGLISH) folder. Please refer to the **MT17B-WS2016-NAT** classroom setup guide for general setup instructions.
2. Shut down **MT17B-WS2016-NAT**.
3. Create a checkpoint named **StartingImage** for **MT17B-WS2016-NAT**.

7. Run the VM-Pre-Import script

In this task, you will run the VM-Pre-Import-10962C.ps1 file. This script will create links to the base and mid-tier images in the import folder which are necessary for importing each virtual machine.

1. Browse to **D:\Program Files\Microsoft Learning\10962\Drives**.
2. Right-click **VM-Pre-Import-10962C.ps1**, and then click **Run with PowerShell**. Press **Y**, and then press Enter if prompted.
3. At the **On which disk drive are the base images extracted** prompt, type the appropriate drive letter to which the base images are extracted, and then press Enter.
4. At the **On which disk drive are the course images extracted** prompt, type the appropriate drive letter to which the course images are extracted, and then press Enter.
5. Press Enter to close the PowerShell window.

8. Import the virtual machines on the instructor computer

1. Browse to **D:\Program Files\Microsoft Learning\10962\Drives**.
2. Right-click **10962C_ImportVirtualMachines.ps1**, and then click **Run with PowerShell**. Press **Y**, and then press Enter if prompted.
3. At the **On which disk drive are the course virtual machines extracted** prompt, type the appropriate drive letter to which the course images are extracted, and then press Enter.

9. Configure the virtual machines on the instructor computer

1. Open **Hyper-V Manager**, right-click **10962C-LON-DC1**, and then click **Start**.
2. Right-click **10962C-LON-DC1**, and then click **Connect**. Verify that the computer starts.
3. Sign in as **Adatum\Administrator** using a password of **Pa55w.rd**. Verify that the sign in is successful. If a **Networks** prompt appears, click **Yes**.
4. **For Windows Server 2016:** Open an administrative command prompt, type **slmgr –rearm**, press Enter, and then restart the computer.
5. After the computer restarts, sign in as **Adatum\Administrator** using a password of **Pa55w.rd**.
6. **For Windows 10:** Information about activation and steps about how to obtain product keys for activation can be found on the Born To Learn website at: http://go.microsoft.com/fwlink/?LinkId=270851, and in Appendix B.
7. **Only for 10962C-LON-CL1 virtual machine:**
   a. From the Start screen, type **cmd**.
   b. Right-click **Command Prompt**, and then click **Run as administrator**.
   c. At the command prompt, type the following commands in order. This will rearm Office 2016:

```
CD \
CD C:\Program Files\Microsoft Office\Office16
cscript ospp.vbs /rearm
```

8. Shut down the virtual machine.
9. Repeat steps 1-8 for the following virtual machines:
   - **10962C-LON-CL1**
   - **10962C-LON-SVR1**
10. Browse to **D:\Program Files\Microsoft Learning\10962\Drives**.
11. Right-click **TakeVMSnapshot.ps1**, and then click **Run with PowerShell**.
12. Press **Y**, and then press Enter if prompted.
13. At the **What do you want to call the Snapshot** prompt, type **StartingImage**, and then press Enter.

10. Install the PowerPoint slides

- Install the PowerPoint slides for the learning product by extracting the files included in **10962C-ENU-PowerPoint.exe**.

Student Computer Checklist

- ☐ 1. Install the Hyper-V Server role
- ☐ 2. Install the base image and virtual machine files

Student Computer Setup

Use the instructions in the following section to set up the classroom manually. Before starting the student computer installation, you must install a supported operating system on the computer. You can review 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 USB drive.

1. Install the Hyper-V Server role

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

For detailed instructions, see Instructor Computer Setup in this document.

2. Install the base image and virtual machine files

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

D:\Program Files\Microsoft Learning\10962 and all included folders and files

C:\Program Files\Microsoft Learning\Base

1. Verify that all permissions have been retained by looking at the directories above and ensuring they are not set to Read Only.
2. Run the scripts. For detailed instructions, see the Instructor Computer setup instructions in this document.
3. Add the virtual machines to the Hyper-V management console. For detailed instructions, see Instructor Computer Setup in this document.

Appendix A: Keyboard Layout

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

If your physical keyboard does not match the above layout, you might need to refer to the above layout for the character positions used to sign in. For future sign-in's and usage throughout the labs, you might want to install your keyboard layout in the virtual machine.

Appendix B: Activating the Windows 10 Virtual Machine

Obtaining product keys for activation

To receive product keys that you will use to activate the Windows 10 virtual machines accompanying this course, follow the guidelines described at: http://go.microsoft.com/fwlink/?LinkId=270851

Activating a Windows 10 virtual machine

You must first ensure that the **MT17B-WS2016-NAT** virtual machine and any domain controller (if required for the course) have been started, and that the **MT17B-WS2016-NAT** virtual machine has Internet connectivity. Then, perform the following steps to activate the Windows 10 virtual machine:

1. On the Windows start page, type **cmd**.
2. Right-click **Command Prompt**, and then click **Run as Administrator**.
3. If prompted, click **Yes** in the **User Account Control** dialog box.
4. At the command prompt, type **slmgr /ipk <*product key*>**, and then press Enter.
5. Click **OK** in the dialog box.
6. At the command prompt, type **slmgr /ato**, and then press Enter.

Note: In order for you to activate the virtual machine successfully, the virtual machine must have Internet connectivity.

7. In the dialog box, click **OK**.

Note: The Windows 10 client virtual machines will need Internet access to allow activation. This is provided through the **MT17B-WS2016-NAT** virtual machine. The virtual machine and associated Setup guide is available from the MCT Download Center. High-level details are included below.

To configure the MT17B-WS2016-NAT virtual machine

MT17B-WS2016-NAT is used for activation and for Internet access when needed for specific labs.

1. Set up the **MT17B-WS2016-NAT** virtual machine. The **MT17B-WS2016-NAT** virtual machine and its related Setup guide can be downloaded from the MCT Download Center in the Base Virtual Hard Disks – Mid-Tiers (ENGLISH) folder. Please refer to the **MT17B-WS2016-NAT** classroom setup guide for general setup instructions.
2. Shut down **MT17B-WS2016-NAT**.
3. Create a checkpoint named **StartingImage** for **MT17B-WS2016-NAT**.
4. Restart **MT17B-WS2016-NAT** to provide Internet access.