MODULE 2 HANDS ON

Lawrencia Agyemang

I sent you a text informing, you of how the computer restarted on me and removed all my work/screenshots, I was only able to get a few back

Module 2 Hands on Exercises

Insert screenshots showing intermediate steps and completion of each of the projects in the document below

Add a coversheet with your name, module title, and pledge

These Hands-On Projects should be completed in the order given and should take a total of three hours to complete. The requirements for these projects include:

• A system with Windows Server 2019 installed according to Hands-On Project 1-1 (Lab Environment 1) or Hands-On Project 1-2 (Lab Environment 2).

Project 2-1: Server Manager

In this Hands-On Project, you explore the different configuration and management features of Server Manager.

- Boot your Windows Server 2019 host and log into the system as Administrator using the password Password01. After a few moments, Server Manager will open. If prompted to try the Windows Admin Center, select Don't show this message again and close the information window.
- Within the Server Manager Dashboard, observe the roles and server groups shown. Note that your server is represented by Local Server, a member of the All Servers group and has the File and Storage Services role installed. Also note whether there are any services that are flagged red. If this is the case, click Services under your Local Server and note the services that are not started and the reason why.
- Highlight Local Server in the navigation pane of Server Manager.
 - Observe the default events shown in the Events pane. Next, click **Tasks**, **Configure Event Data** within the Events pane. At the Configure Event Data window, select **Informational** and click **OK**. Note the additional events that are now shown within the Events pane.



• In the Performance pane, click **Tasks, Configure Performance Alerts**. Note the default alert thresholds and graph display period and click **Cancel**.

Manager		- 0 X		
🛛 🕶 Server N	1anager • Local Server 🛛 - 🐵 l 🚩 🖡	tanage Toots View Help		
	Warnings or Errors (0 of 0 total	TASKS 💌 ^		
aboard I Sarver	Filter P (B + R +	•		
awers	Filter applied. × Clear All			
6	Server Name Severity Title	Category		
ing1	No matches found			
>				
nd Storana Sanirar A				
r-V				
Services				
	Loose in the relativity in the neuron sector			
	Set Performance Alert Thresholds			
	After you change thresholds and click Save, updated data is displayed for this group or role.			
	CPU (% usage) 85		the second se	
	Memory (MB available) 2	TASKS 💌		
	Set Performance oraph Display Period The performance oraph area for this role or server oroup displays performance data for the number of days.			
	specified in the Graph display period setting. Lower values show a shorter graph.	2 pm 4 pm		
	Graph display period (days) 1 ~			
	Save			
	ρ (i) • (ii) •	- ·		
	server name Counter status CPU Alert Count Memory Alert Count First Occurrence Last Occurre	nce		
	KUREK Off			
	ROLES AND FEATURES	1 mm	Activate Windows	
	All roles and teatures (81 total	TASKS 🔻		
	Filter ρ (8) ▼ (8) ▼	۲		

- In the Roles and Features pane, click Tasks, Add Roles and Features.
 - At the Before you begin page, select the Skip this page by default checkbox, and click Next.
 - At the Select installation type page, click **Next**.
 - At the Select destination server page, click **Next**.
 - At the Select server roles page, select **DHCP Server**, and click **Add Features** when prompted. If prompted to continue after validation errors



(because your system has a DHCP-assigned IP address), click **Continue**. Click **Next** when finished.

• At the Select features page, select **Telnet Client** and click **Next**.



- At the DHCP Server page, read the information regarding best practices and click **Next**.
- Click Install to install the DHCP Server role and Telnet Client feature.

- After the installation has completed, click **Complete DHCP configuration**, click **Commit**, and then click **Close**.
- Click **Close** to close the Add Roles and Features Wizard.
- Highlight **DHCP** in the navigation pane of Server Manager.
 - In the Best Practices Analyzer pane, click **Tasks, Start BPA Scan**, and then click **Start Scan**. Note the Warning and Error that you receive.
 - In the Services pane, right-click the **DHCP Server** service and click **Stop Services**.
- Click **Dashboard** in the navigation pane of Server Manager. Note that there is one service and one BPA result red flagged for the DHCP, Local Server and All Servers groups.
 - Click Services under Local Server and note that the DHCP Server service is stopped. Right click the DHCP Server service, click Start Services, and then click OK. Click the Refresh button in the upper right of Server Manager and note that the servicerelated red flag disappears.
 - Click **BPA results** under Local Server and note the Predeployment error shown. Right click the error, click **Exclude Result**, and then click **OK**. Click the **Refresh** button in the upper right of Server Manager and note that the BPA-related red flag disappears.
- In the upper right of Server Manager, click Manage, Add Servers. Note that you can add servers within your Active Directory domain, by DNS name, or import them from a file. Because your computer is not domain-joined, you do not see entries under the Active Directory tab. Click Cancel.
- In the upper right of Server Manager, click **Manage**, **Create Server Group**. In the Create Server Group window, specify a name of **Building1** in the Server group name box. Next, highlight **SERVERX** in the Server Pool tab, click the arrow button to move it to the

Selected pane, and click **OK**. Note that your new server group appears within the navigation pane.

- Highlight Building1 in the navigation pane of Server Manager. Right-click SERVERX in the Servers pane and note the options available on the menu. Select the Windows PowerShell option to open a Windows PowerShell console as Administrator. Close the Windows PowerShell console when finished.
- In the upper right of Server Manager, click **Tools** and note the tools that are available. Next, click **Manage, Server Manager Properties**. In the Server Manager Properties window, select **Do not start Server Manager automatically at logon** and click **OK**.
- Close the Server Manager window.

Project 2-2: Windows Admin Center

In this Hands-On Project, you install and explore the different configuration and management features of the Windows Admin Center.

• On your Windows Server 2019 host, open the Google Chrome Web browser and navigate to https://aka.ms/WindowsAdminCenter. Follow the prompts to download the latest non-preview version of the Windows Admin Center. When finished, the downloaded file will automatically be opened to start the installation.

- At the Windows Admin Center Setup screen, select I accept the terms in the License Agreement and click Next.
- At the Use Microsoft Update page, click **Next**.
- At the Install Windows Admin Center on Windows Server page, click Next.
- At the Installing Windows Admin Center page, click **Next**. Note that the installation program will generate a self-signed encryption certificate for use on port 443 (HTTPS) and click **Install**.
- Click Finish.
- Navigate to https://SERVERX:443 within the Chrome Web browser and click Skip tour when prompted. Maximize your Chrome Web browser screen.
- At the All connections page, click **Add**, **Servers**. Note that you can add servers by server name or import a list of server names. Click **Cancel**.
- Highlight **serverx** within the All connections page and click **Edit tags**. At the Edit connection tags window, type **2019HOST** and click **Save**.
- Highlight **serverx** within the All Connections page and click **Connect**. Within the Overview tool, view the information shown and then click **Manage alerts**.
 - Select **Environment variables** and note that you can create and edit system and user environment variables.
 - Select **Power configuration**, select the **High performance** power plan and click **Save**.
- Highlight **Devices** within the Tools pane. Note that you can disable existing hardware devices or update their device drivers.

- Highlight **Network** within the Tools pane. Select your Ethernet adapter and click **Actions, Settings**. Note that you can configure IPv4 and IPv6 settings for your Ethernet adapter.
- Highlight **PowerShell** within the Tools pane to open a Windows PowerShell prompt. Type **exit** and press **Enter** to stop your Windows PowerShell session.
- Highlight **Registry** within the Tools pane. Expand **HKEY_CLASSES_ROOT** and highlight **.ac3**. Note that you can add, modify, and delete values.
- Highlight **Roles & Features** within the Tools pane. Select **DHCP Server** and click **Remove**. Click **Yes** to remove the role.
- Optionally navigate to the other tools within the Windows Admin Center and note their functionality. Close Google Chrome when finished.

Project 2-3: Configuration Utilities

In this Hands-On Project, you explore various Windows configuration utilities available within Windows Server 2019.

- On your Windows Server 2019 host, click **Start** and then click **Control Panel**.
- Navigate to **System and Security, System, Advanced system settings**. Under the Performance section of the System Properties window, click **Settings**.
 - Next, highlight the **Advanced** tab and note the default setting for Processor scheduling.
 - Click **Change** and note the default size of the paging file that is currently allocated on your system. Because the paging file size is managed by the system by default, this value should be close to the recommended value shown.
 - Click **OK** to close the Virtual Memory window.
 - Highlight the **Data Execution Prevention** tab and note the default settings that apply DEP to all programs and services.
 - Click **OK** to close the Performance Options window.
- Under the Startup and Recovery section of the System Properties window, click **Settings**. Note the default options and location of the dump file. Click **OK** to close the Startup and Recovery window when finished.
- At the bottom of the System Properties window, click **Environment Variables**.
 - In the User variables for Administrator section, click **New**.
 - At the New User Variable window, supply a Variable name of VAR1 and Variable value of Sample Variable and click **OK**.
 - In the System variables section, note the values of the Path, TEMP, TMP, and windir variables and click **OK**.
- In the System Properties window, highlight the **Hardware** tab and click **Device Manager**.
 - Devices that require attention will be marked with a yellow label and shown by default. If you see any Unknown devices, right-click the device, choose **Update driver** and follow the prompts to search for a driver on the Internet or from removable media supplied by your manufacturer.

- Expand **Disk drives**, right-click your storage device, and click **Properties**. Highlight the **Policies** tab and note that write caching is enabled on the device by default but that flushing is not. Click **OK** to close the properties window.
- Close Device Manager and click **OK** to close the System Properties window. If you are prompted to restart your computer to apply changes, click **Restart Later**.
- In the Control Panel window, click **Control Panel** in the navigation bar to switch back to the Category view. Next, click **Add a device** under the Hardware category. Your system will search for devices that may not have been detected by PnP. Follow any prompts to install devices that are found. If no devices were found, click **Cancel**. Close Control Panel when finished.

Project 2-4: Cmdlets

In this Hands-On Project, you work with common Windows PowerShell administrative cmdlets.

- On your Windows Server 2019 host, open the Google Chrome Web browser. Next, right-click the **Start** menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell.
- At the prompt, type Get-Process | more and press Enter. Note that there are many processes with a ProcessName of chrome that comprise the Google Chrome Web browser. Press q to quit the more command. Next, type Stop-Process -name chrome and press Enter. Note that the Google Chrome Web browser app was closed.
- At the prompt, type Get-Service | ogv and press Enter. Note that the App Readiness service is called AppReadiness and is not started by default. Close the GridView window. Next, type Start-Service -name AppReadiness and press Enter to start the service. Next, type Stop-Service -name AppReadiness and press Enter to stop the App Readiness service.
- At the prompt, type Get-WindowsFeature | ogv and press Enter to view installed roles and features. Note that the Telnet Client feature that you installed earlier in Hands-On Project 2-1 is given the name Telnet-Client. Close the Out-GridView window. Next, type Remove-WindowsFeature -name Telnet-Client and press Enter to remove the feature.
- At the prompt, type Test-NetConnection and press Enter to test your network connectivity to internetbeacon.msedge.net. Next, execute the following commands at the command prompt, in turn. For each one, note the network configuration information displayed.

```
Get-NetIPConfiguration
Get-NetAdapter
Get-NetAdapterStatistics
```

• Close Windows PowerShell.

Project 2-5: Cmdlet Output

In this Hands-On Project, you modify the output of Windows PowerShell cmdlets.

- Right-click the **Start** menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell.
- At the prompt, type cd \setminus and press Enter to switch to the root directory. Next, type dir and press Enter to list the contents of this directory.
- At the prompt, type alias dir and press Enter. Next, type alias gci and press Enter. Note that dir and gci are aliases to the Get-ChildItem cmdlet. Execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary). Get-ChildItem

```
gci | sort -property name
gci | Format-List
gci | Format-List -property name,lastwritetime
gci | Format-Wide
gci | Format-Wide -column 3
gci | Format-Wide -column 3 -property length
gci | Format-Wide -column 3 -property name -groupby length
gci | Format-Table
gci | Format-Table
gci | Format-Table -property name,length,lastwritetime
gci -recurse
gci -recurse
```

 Other cmdlets that generate a large amount of information may require that you use additional Windows PowerShell features to modify command output for organization and readability. Execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).

```
Get-EventLog System | more
Get-EventLog System | Group-Object eventid | more
Get-EventLog System | Group-Object eventid | Out-GridView
(Close the GridView window when finished.)
```

```
Get-EventLog System | Group-Object eventid | ogv (Close the GridView window when finished.)
```

```
Get-Process | ogv
(Close the GridView window when finished.)
```

```
Get-Process | ConvertTo-HTML | Out-File C:\PList.html
Invoke-Item C:\PList.html
(Choose to open in Google Chrome, and close Chrome when finished.)
```

```
Get-Process | Export-CSV C:\PList.csv
Invoke-Item C:\PList.csv
(Choose to open in WordPad and close WordPad when finished.)
```

• Close Windows PowerShell.

Project 2-6: PowerShell Providers

In this Hands-On Project, you work with PowerShell providers.

- Right-click the **Start** menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell.
- At the prompt, type Get-PSProvider and press Enter to view the available PowerShell providers. Next, type Get-PSDrive and press Enter to view the expanded list of PowerShell providers. Note that the filesystem provider is available for each drive letter on the system, and that registry provider is available for HKEY_CURRENT_USER and HKEY_LOCAL_MACHINE.
- Each PowerShell provider treats each item that it works with as an object. At the prompt, type gci | Get-Member and press Enter to view the properties available for the objects within the current directory of the filesystem provider. Note that there is a PSIscontainer property that indicates that the object is a subdirectory. Next, type gci | Where-Object {\$_.psiscontainer} and press Enter to view only directories. Following this, type gci | Where-Object

{!\$.psiscontainer} and press Enter to view only non-directories (i.e., files).

• Within the filesystem provider, you can create, edit, and remove objects, such as files and directories. Execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).

```
new-item -path C:\-name mydir -type directory
new-item -path C:\mydir -name lala.txt -type file
get-content c:\mydir\lala.txt
add-content c:\mydir\lala.txt -value "This is line 1"
add-content c:\mydir\lala.txt -value "This is line 2"
add-content c:\mydir\lala.txt -value "This is line 3"
get-content c:\mydir\lala.txt
set-content c:\mydir\lala.txt -value "This is the only line"
get-content c:\mydir\lala.txt
remove-item c:\mydir -recurse
```

At the prompt, type sl env: \ and press Enter to switch to the environment provider. Next, type gci and press Enter to view the environment variables on the system. In many PowerShell providers, you can instead use the Get-Item cmdlet (alias gi) to view items. Type gi * and press Enter to view all items within the environment

provider. Next, execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).

```
gi * | sort-object -property name
gi windir
gi windir | format-list *
new-item -path.-name lala -value "This is cool!"
gi lala
gi lala | format-list *
rename-item -path env:lala -newname po
gi po
gi po | format-list *
gi * | sort-object -property name
remove-item po
```

• At the prompt, type sl variable: \ and press Enter to switch to the variable provider. Next, type gci and press Enter to view the user-defined PowerShell variables on the system. Next, execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).

```
gci | sort {$_.Name}
get-variable home
get-variable home | format-list
new-variable oobla
set-variable oobla -value "Toast"
get-variable oobla
set-variable tinky -value "Winky"
get-variable tinky
remove-variable tinky
```

- At the prompt, type sl alias:\ and press Enter to switch to the alias provider. Next, type gci and press Enter to view the user-defined PowerShell variables on the system. Following this, type gci | Where-Object {\$_.name -like "c*"} and press Enter to view aliases that start with c. Note that "clear" is an alias to Clear-Host.
- You can also view aliases by their definition. At the prompt, type gci | Where-Object {\$_.definition -like "c*"} to view aliases that point to cmdlets that start with the letter c.
- At the prompt, type sl function: \ and press Enter to switch to the function provider. Next, type gci and press Enter to view the functions on the system. Note that Clear-Host is a function. Next, type Get-Content Clear-Host and press Enter to view the content of the Clear-Host function.
- At the prompt, type sl cert: \ and press Enter to switch to the certificate provider. Next, type gci and press Enter. Note that the certificate provider can manage certificates for the current user and local computer. Next, type gci -recurse and

press **Enter**. Note the self-signed certificate installed on your system by the Windows Admin Center is displayed in the list.

- At the prompt, type sl 'HKLM:\software\microsoft\windows nt\currentversion' and press Enter to switch to the registry provider for HKEY_LOCAL_MACHINE and navigate to the currentversion subkey for your Windows server system. Next, type set-itemproperty -path winlogon -name legalnoticecaption -value "Hey!" and press Enter to set a legal notice caption for local logon attempts. Finally, type set-itemproperty -path winlogon -name legalnoticetext value "What are you doing on my system?" and press Enter to modify the text message for local logon attempts.
- Right-click the **Start** menu and click **Shut down or sign out**, **Sign out**. Press Ctrl1Alt1Del (or Ctrl1Alt1End if you are running Windows Server 2019 within a Hyper-V virtual machine on Windows 10). Note your legal notice and click **OK**. Log into the system as Administrator using the password **Password01**.

Project 2-7: WMI

In this Hands-On Project, you query WMI using Windows PowerShell.

- Right-click the **Start** menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell.
- At the prompt, type alias gwmi and press Enter. Note that gwmi is an alias to Get-WmiObject. Next, execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).

```
gwmi win32 bios
gwmi win32 processor
gwmi win32 processor | gm
gwmi win32 computersystem
gwmi win32 computersystem | fl *
gwmi win32 logicaldisk
gwmi win32 logicaldisk | fl *
gwmi win32 diskdrive
gwmi win32 diskdrive | fl *
gwmi win32 share
gwmi win32 share | fl *
gwmi win32 networkadapterconfiguration
gwmi win32 networkadapterconfiguration | fl *
qwmi win32 desktop
gwmi win32 desktop | fl *
gwmi win32 share -filter name=""c$"
gwmi win32 logicaldisk -filter name="'c$'" |
Measure-Object -property freespace -Minimum -Maximum
```

```
gwmi win32_logicaldisk -filter name="'c$'" |
Measure-Object -Property freespace -Minimum -Maximum |
Select-Object -Property freespace, maximum, minimum |
Format-Table -autosize
```

You can also query WMI using WQL syntax. Execute the following commands at the command prompt, in turn. For each one, interpret the output (referencing the aliases and cmdlets within this module, as necessary).
 gwmi -query "Select * from win32_share"
 gwmi -query "Select * from win32_share" | gm
 gwmi -query "Select name,path,allowmaximum from win32_share"

```
<code>gwmi -query "Select name,path,allowmaximum from win32_share where name='c$'"</code>
```

```
gwmi -query "Select name from win32_share" | Sort-Object -property
name | Format-List -property name
gwmi -query "Select name from win32_share" | Sort-Object -property
name | Format-List -property name >
C:\scripts\ShareInformation.txt
```

notepad C:\scripts\ShareInformation.txt

• Close Notepad and Windows PowerShell.

Project 2-8: PowerShell Customization

In this Hands-On Project, you enable script execution and create a PowerShell profile script that loads a custom alias and function. Next, you create a PowerShell console file to customize your Windows PowerShell experience.

- Right-click the **Start** menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell.
- At the prompt, type Set-ExecutionPolicy unrestricted and press Enter. Type Y when prompted to confirm. Next, type Test-Path \$profile and press Enter. Note that you do not have a PowerShell profile script configured.
- At the prompt, type New-Item -path \$profile -itemtype file -force and press Enter to create a PowerShell profile. Next, type notepad \$profile to open your PowerShell profile script within Notepad. Add the following lines: Write-Host "Hello" Set-Alias lala Get-Service function pro {notepad \$profile}
- Click File, Save within Notepad to save your changes. Close Notepad when finished.
- At the prompt, type cd Desktop and press Enter to switch to your Desktop directory. Next, type export-console CustomPS and press Enter to create a CustomPS.psc1 file on your Desktop that can be used to open Windows PowerShell. Close Windows PowerShell when finished.

- Double-click the **CustomPS** file on your desktop to open Windows PowerShell. Note that your PowerShell profile script executed and printed Hello to the screen. Type lala and press **Enter** to test your alias. Next, type pro and press **Enter** to test your function. Close Notepad when finished.
- Click the PowerShell icon in the upper left of the Windows PowerShell window and click **Properties**. Navigate through the properties and make some visual changes to your liking (color, font, and so on). Click **OK** to close the Properties dialog box and close Windows PowerShell when finished.
- Double-click the **CustomPS** file on your desktop to open Windows PowerShell. Note that your customizations are available. Close Windows PowerShell when finished.
- Right-click the Start menu and choose **Windows PowerShell (Admin)** to open Windows PowerShell. Note that your customizations are not available as PowerShell was not started via the CustomPS.psc1 file.
- Close Windows PowerShell.

Project 2-9: PowerShell Scripting

In this Hands-On Project, you create and execute a basic PowerShell script using Windows PowerShell ISE, and execute it on the system.

1. Click **Start**. Next, right-click **Windows PowerShell ISE** and click **More, Run as administrator**.

2. Click the **New Script** button above the Windows PowerShell pane, and enter the following contents:

```
#This script prints process information to the screen for
#a process that the user is prompted to supply during
#script execution
$ans=Read-Host "What process would you like to query?"
Get-WmiObject win32_process -Filter "name='$ans'" | Format-Table
HandleCount,VirtualSize,UserModeTime,KernelModeTime,ProcessID,Na
me
```

Module 2 Configuring Windows Server 2019 145

Copyright 2021 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s).

Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

3. Click the **Run Script** button (or press **F5**) to test your script in the Windows PowerShell console. Type the value svchost.exe and press **Enter** when prompted.

4. After your script executes properly, click File, Save As. Type C:\myscript.ps1 in the File name box and click Save.

5. Close Windows PowerShell ISE.

6. Right-click the Start menu and choose Windows PowerShell (Admin) to open Windows

PowerShell.

7. At the prompt, type cd \ and press Enter to switch to the root of C:\. Next, type ./ myscript.ps1 and press Enter to execute your script again. Type the value svchost. exe and press Enter when prompted.

8. Close Windows PowerShell.