

Laboratory Report



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Report Title:	Report-4 : Learning PowerShell, its usage and commands
File Name:	L00171202_Report_4.pdf
Submit to:	Blackboard in PDF format only
Date Submitted:	23th December 2022

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Module:	IAC CP90x

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Description

This report gives an overview of what was done for the week 10 and 11 in terms of practical work. It covers how to install and use PowerShell 7, as well as scripting in PowerShell. The results of what was done are mentioned in the Results and Testing section, and finally, we provide a rationale for the steps taken in the Methodology and Aim sections.

Aims

This report is about how to install PowerShell 7, and how to use its basic and advanced commands.

1. To use PowerShell, you must first install it.
2. Loops/Conditional scripts, Variables.
3. Establishing a domain with PowerShell.
4. Configuration of the desired state in Windows 2019.

Methodology

In this section, we will learn how to install PowerShell 7, and some of its basic and advanced features. Then, we will go on to explain how we can use these features to achieve our goals.

1. PowerShell is installed by default in Windows, but the version is 5 and is out of date; the most recent version available is 7. To see which version is installed, use the command: `$PSVersionTable`, a script to install PowerShell 7 is created and attached to this report; in this script, we installed Nuget, and then PowerShell 7 can be installed from the gallery. More information can be found in the lecturer's notes [1].
2. We examined variables, which may hold any kind of object (including strings, arrays, and integers) as value. By default, a variable's value is null, but in PowerShell, services from the operating system can also be added. Loops such as For loops, while loops, ForEach, Do while, etc. can be used. Powershell allows for the use of switch statements. Lesson notes [2] go into more detail on this.
3. In order to set up a remote server, a Windows 2019 desktop was designated as the domain controller, and Setup DC1.ps1 was developed. A Windows 2019 Core computer was designated as the server, and Setup Server1.ps1 was created. Consult the lecturer's notes [3]
4. Aiming for the Ideal State After carrying out the configuration and implementation of the DSC-based script, the command **Start-DscConfiguration -Path C:PowerShellWT4DscConfiguration -Verbose -Wait -Force** was used to run the script. Consult the lecturer's notes [4].

Results and Testing

This component of the report includes exercises that are planned and described as well as the results of testing done after the methodology steps:

1. Step 1 of the methodology was followed to install PowerShell 7, as well as Nuget installation and Powershell installation scripts. Please see for the lecturer's notes.
2. The use of variables, loops like For, Foreach, while, Do/Until, switch statements, and If Else conditional statements was accomplished by applying step 2 of the methodology. Please see [2] the lecturer's notes.
3. Following step 3 of the methodology, the Windows 2019 Desktop Setup DC1.ps1 script was executed and it was considered a domain controller, the Windows 2019 Core Setup Server1.ps1 script was executed and it was considered a server, the creation of a second

domain controller was completed using the script Setup DC2.ps1, and the creation of users was completed using the script CreateUsers. The ps1 script was run on the dc-1 machine.

4. It was possible to configure DSC (Desired State Configuration), which may be used to manage and persist server configurations, by adhering to step 4 of the methodology. Consult the lecturer's notes [4].

Conclusions

With reference to the lecturer's notes, it was decided in this report that PowerShell 7 installation in Windows should be accomplished by performing Step 1 from the Methodology [1]. PowerShell basic and advanced command learning, scripting concepts such loops, variables, and conditional statements, remote configuration using PowerShell for the construction of DC1 and DC2 with server 1, and the notion of DSC (Desired State Configuration).

Users and script writers can utilize Windows PowerShell as a type of command-line shell and scripting environment to access the .NET Framework. By developing scripts and mixing various instructions, it was intended to define and automate arduous tasks. PowerShell over CMD has the primary benefit of enabling administrators to remotely control networks. PowerShell Remote is the main network connection management channel. Today, more GUI management consoles rely on remote, therefore Microsoft must make PowerShell more robust from a distance. Its base in a complete .NET programming framework has made its scripts easier to develop and significantly boosted stability. By using script codes and command lines, users can construct functionality using PowerShell's workflow. The written scripts can be integrated with other scripts to finish more jobs or saved for later usage once a certain task has been completed [5].

There are some disadvantages to using PowerShell, such as potential security vulnerabilities. As previously stated, IT managers frequently use it to connect remotely to other PCs and servers, which can lead to security flaws. Another issue is that using remote capabilities in Windows PowerShell requires the host to run a Web server. This procedure takes up additional space on a server. If we worked in IT or as an Active Directory network administrator, we would find this tool useful. This is because cmdlets can call hundreds of custom instructions, boosting your productivity [6].

The Windows command prompt, also referred to as CMD, is the initial shell of the Microsoft DOS operating system. Each operating system has a number of command windows. The 32-bit command-line program for the Windows operating system is called cmd.exe. To begin managing your hard drive, for instance, run the diskpart.exe command. A user can handle your machine by running a variety of programs. A new Microsoft shell called Windows PowerShell combines CMD's functionality with new scripts and cmdlets. The cmdlets, which are autonomous programming objects, are used to display the Windows administrative options. It can be used to define complex jobs using reusable scripts to save time. Users can also control their machine using a number of practical PowerShell command [7].

In addition to Linux shell, PowerShell also has other competitors. PowerShell and Linux shell commands share many similarities. The command-line interface provided by both shells allows users to interact with the operating system. Both shells offer users the possibility to automate operations using scripting. However, there are some major differences between the two shells in these key areas. The Microsoft PowerShell shell is proprietary, but the Linux shell is free source. While PowerShell is only available on Windows, the Linux shell is available on a wide range of devices. Additionally, compared to PowerShell, the Linux shell provides a much greater range of capabilities and commands [8].

As a result, we can conclude that the objectives of this report have been fully executed and demonstrated for PowerShell commands, remote script creation, basic scripting functionalities in PowerShell, and so on.

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Appendices