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1. What is PowerShell?

PowerShell is a command-line shell and scripting language designed for system administration and automation on Windows. It extends the capabilities of the traditional Command Prompt (CMD) by adding more powerful scripting and automation features.

2. Opening PowerShell

- Method 1: Press Win + R, type powershell, and press Enter.
- Method 2: Search “PowerShell” in the Start Menu.
- Method 3: Shift + Right Click in any folder → “Open PowerShell window here”.
- Run as Admin: Right-click “Windows PowerShell” → Select Run as Administrator.

3. Basic PowerShell Commands

1. Get Current Directory

Get-Location

2. List Files and Folders

Get-ChildItem

Short Version:

dir

3. Change Directory

Set-Location <path>

Example:

Set-Location C:\Users

Short Version:

cd C:\Users

4. Go to Parent Directory

cd ..

5. Create a New Folder

```
New-Item -ItemType Directory -Name "NewFolder"
```

6. Create a New File

```
New-Item -ItemType File -Name "file.txt"
```

7. Delete a File or Folder

```
Remove-Item <filename or foldername>
```

Force Delete (No Confirm):

```
Remove-Item <filename> -Force
```

8. Copy Files and Folders

```
Copy-Item <source> <destination>
```

Example:

```
Copy-Item file.txt D:\Backup\
```

9. Move Files and Folders

```
Move-Item <source> <destination>
```

10. Rename Files or Folders

```
Rename-Item <oldname> <newname>
```

4. System Information and Network

1. Get IP Configuration

Get-NetIPAddress

2. Check Network Connection (Ping)

Test-Connection google.com

3. Display Active Connections

Get-NetTCPConnection

4. View Running Processes

Get-Process

5. Kill a Process

Stop-Process -Name notepad

6. System Information

Get-ComputerInfo

7. List Installed Programs

```
Get-WmiObject -Query "SELECT * FROM Win32_Product"
```

5. User and System Management

1. List Local Users

```
Get-LocalUser
```

2. Create a New User

```
New-LocalUser -Name "User1" -Password (ConvertTo-SecureString  
"P@ssw0rd" -AsPlainText -Force)
```

3. Delete a User

```
Remove-LocalUser -Name "User1"
```

4. Shutdown / Restart

```
Stop-Computer  
Restart-Computer
```

5. Lock Workstation

```
rundll32.exe user32.dll, LockWorkStation
```

6. Schedule a Shutdown (60 sec)

```
shutdown /s /t 60
```

6. Managing Services

1. List All Services

```
Get-Service
```

2. Stop a Service

```
Stop-Service -Name "wuauserv"
```

3. Start a Service

```
Start-Service -Name "wuauserv"
```

4. Restart a Service

```
Restart-Service -Name "Spooler"
```

7. Managing Disks and Drives

1. Check Disk Space

```
Get-PSDrive
```

2. Format a Drive

```
Format-Volume -DriveLetter D -FileSystem NTFS
```

3. Check for Disk Errors

```
chkdsk C:
```

8. Environment Variables

1. View Environment Variables

```
Get-ChildItem Env:
```

2. Set a New Environment Variable

```
[System.Environment]::SetEnvironmentVariable("MyVariable", "Value",  
"User")
```

3. Get Specific Environment Variable

```
$env:Path
```

9. File and Text Search

1. Search for Files

```
Get-ChildItem -Path C:\ -Recurse -Filter "*.txt"
```

2. Search for Text in Files

```
Select-String -Path *.txt -Pattern "Error"
```

10. Compress and Extract Files

1. Zip Files

```
Compress-Archive -Path file.txt -DestinationPath archive.zip
```

2. Unzip Files

```
Expand-Archive -Path archive.zip -DestinationPath C:\Extracted
```

11. Permissions and Ownership

1. View Folder Permissions

```
icacls C:\Folder
```

2. Change Folder Permissions

```
icacls C:\Folder /grant UserName:(OI)(CI)F
```

3. Take Ownership of a Folder

```
takeown /f C:\Folder
```

12. Advanced Commands

1. Run as Administrator

Start-Process powershell -Verb RunAs

2. Edit the Registry

regedit

3. View Installed Drivers

Get-WmiObject Win32_PnPSignedDriver | Select-Object DeviceName, DriverVersion

13. Useful Shortcuts

Command	Description
clear	Clear the screen
exit	Close PowerShell
cls	Clear console output
echo \$PSVersionTable	Show PowerShell version
hostname	Display computer name
Get-Help <command>	Show command help
history	Show command history
alias	List all command aliases

Tips for PowerShell

- Use Tab to autocomplete commands.
- Use Ctrl + C to stop running commands.
- Combine commands with | to pass output between them.