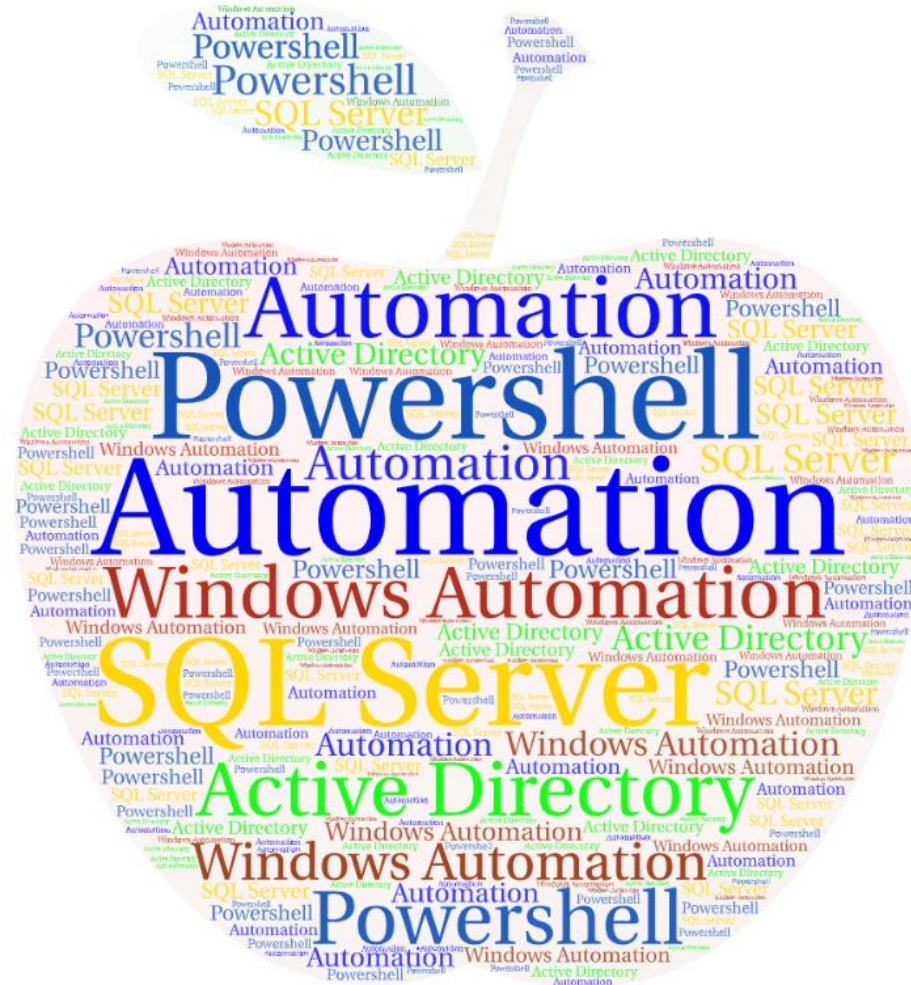



Using Powershell



Powershell 4 Automation

Path to Automation – Course Content

- I. Set up a Lab – The First Easy step – with VMWare Player
- II. What you need to know in Powershell for doing an automation – The Capsule 
- III. Let's write a simple script using powershell.
- IV. Let us start automating. – Final Destination



How to set up your own lab in your laptop

- VMWare Workstation Pro
- VMWare Player
- Oracle Virtual Box



How to set up your own lab in your laptop

Installing VMWare Player in Windows 10



Create Virtual Machines

- CENTRAL SERVER – from where you will be executed
- VM1 – on which the scripts will be executed.
- VM2 – on which the scripts will be executed.

Prerequisite : Windows Server 2016 executable to be downloaded from Windows website.



Create Virtual Machines

- VM1 –Created in the previous video
- VM2 – on which the scripts will be executed.
- CENTRAL SERVER – from where you will be executed



Join the servers to a Domain LAB.com

- CENTRAL SERVER – Configure CENTRAL SERVER as Domain controller server
 - VM1
 - VM2
- } Servers to be joined to the domain



Domain and Domain Controllers



A Windows domain is a form of a computer network in which all user accounts, computers, printers and other security principals, are registered with a domain controller.

A domain controller (DC) is a server computer that responds to security authentication requests within a Windows domain.

Domain controllers
are primarily used to
authenticate and
validate user access
on the network.



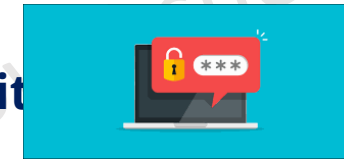
P4A
Powershell 4 Automation

Benefits of Domain Controllers

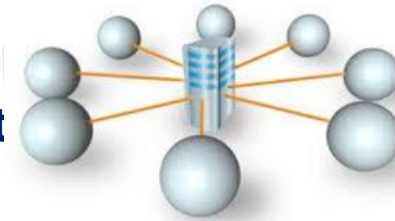
Give Access Only to Those that Need It



Avoid “Operator Error” Data Breaches – Password security



Centralized Infrastructure Management



Shared Computer Resources



Easily Manage Network Printers



Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>



POW



CENTRAL SERVER – Promoting to a Domain Controller



Install the below Roles and features for converting the CENTRAL SERVER to a Domain Controller.

Role

Active Directory Domain Services

Feature

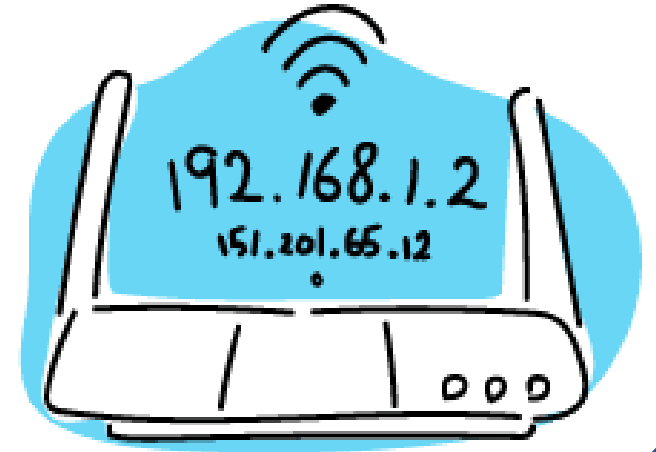
Group Policy Management



Configure DNS and Reverse Lookup Zone



Setting Static IP to the servers



Set static IPs to CENTRAL SERVER, VM1 and VM2

My ISP Router IP : 192.168.225.1

Set VM IPs in the same subnet

Set Virtual Machine IP of CENTRAL Server as 192.168.225.10

Set Virtual Machine IP of VM1 as 192.168.225.11

Set Virtual Machine IP of vm2 as 192.168.225.12



Summary

- Servers VM1, VM2 and the CENTRAL Server can be accessed between each other.
- The domain user LAB\PSUser can be used to access the servers.
- Powershell scripts can be executed across these servers from any of the servers in the domain.
- Access can be managed using the Active directory services.

LAB DOMAIN



Next Video :

Powershell – What you need to know for automation.



Variables and Datatypes in powershell



Variables and Datatypes in powershell

Variables

How to write a variable

`$myvariable = 1000`



Datatypes in Powershell:

String

Constant

Datetime

Boolean

Float

Array



Arrays in Powershell:

Collection of variables or objects

Arrays in PowerShell can contain one or more items. An item can be a string, an integer, an object, or even another array, and one array can contain any combination of these items.

```
$a=1,2,3,4,5
```

Or

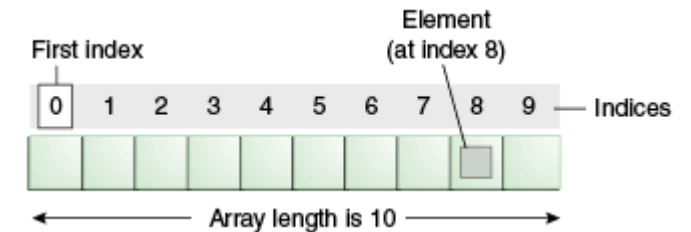
```
$a=1..5
```

More official format is :

```
$a=@(1,2,3,4,5)
```

Or

```
$a=@(1..5)
```



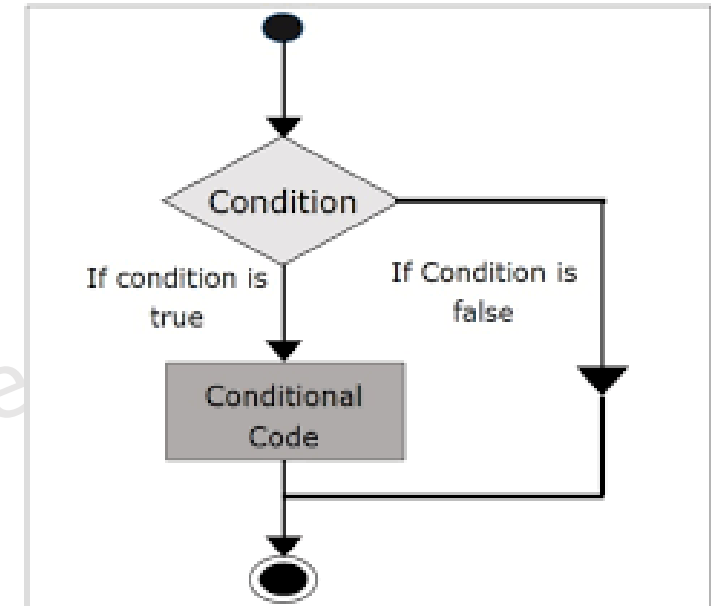
If .. Else .. Elseif....statements

Way to perform a flow control operation

Comparison to determine what kind of action should take place based on a condition.

```
$x = 30
```

```
if($x -eq 30){  
    write-host("This is if statement")  
}else {  
    write-host("This is else statement")  
}
```

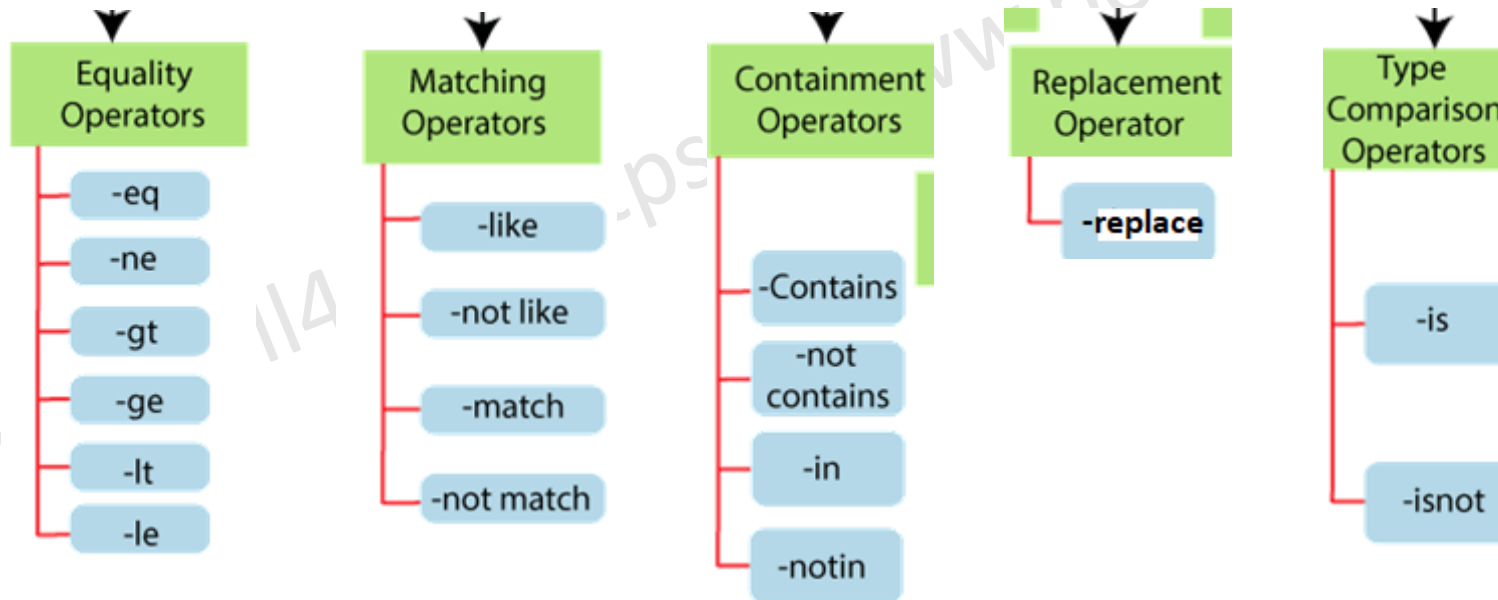


Comparison Operators

Way to perform a comparison operation

Compare values and return true or false.

Comparison Operators



For loop

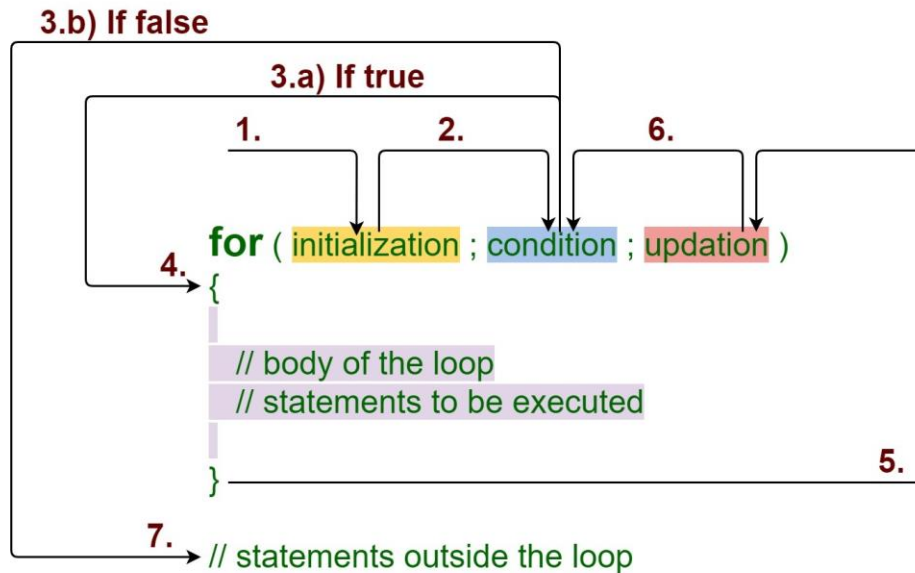
Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>

For loops can be used to step through array values by setting the initial value to the initial index of the array and incrementally increasing the value until the array length is met.

For Loop



```
for($i=0;$i -lt 10 ;$i++)  
{  
  $i  
}
```



Powershell 4 Automation

while and do-while loop

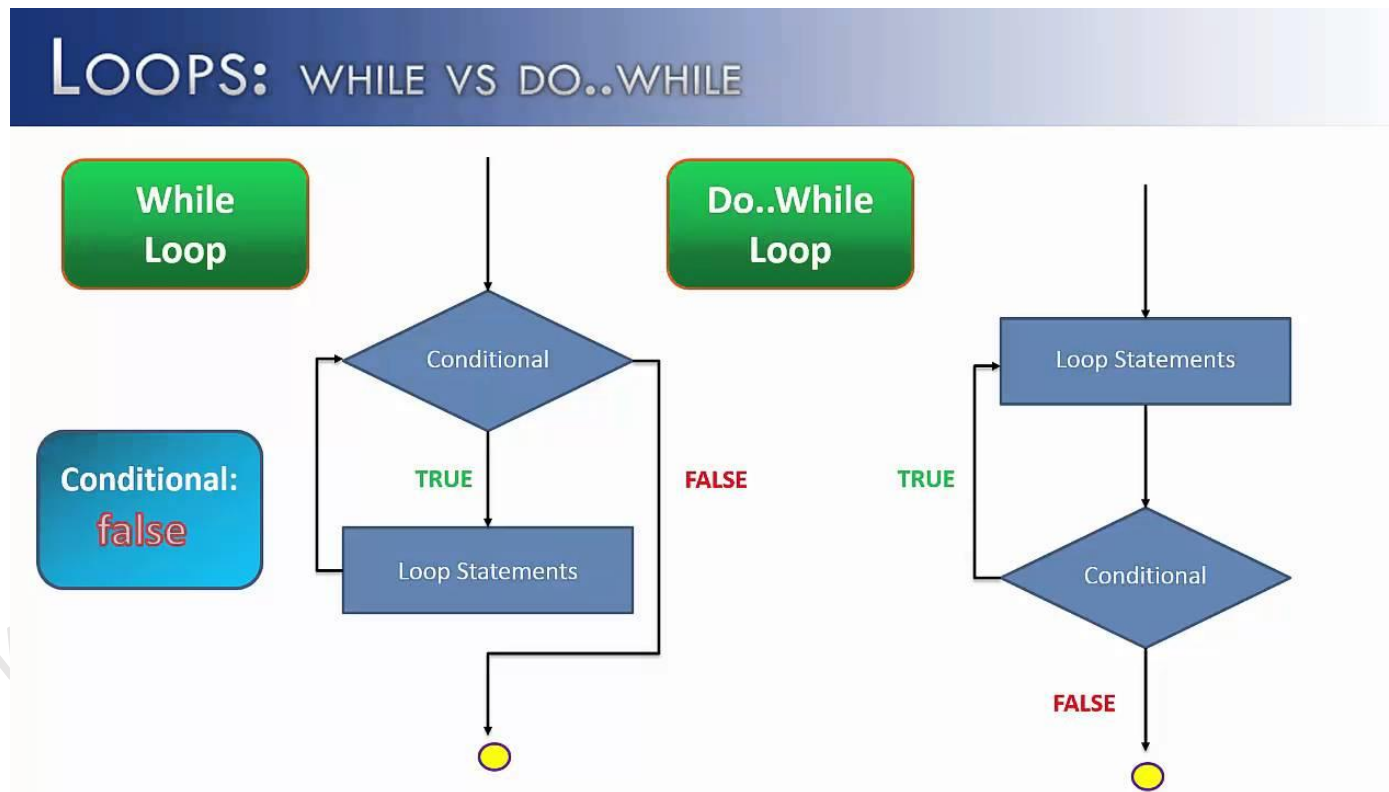
Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>

while loop check condition before iteration of the loop.

do-while loop verifies the condition after the execution of the statements inside the loop



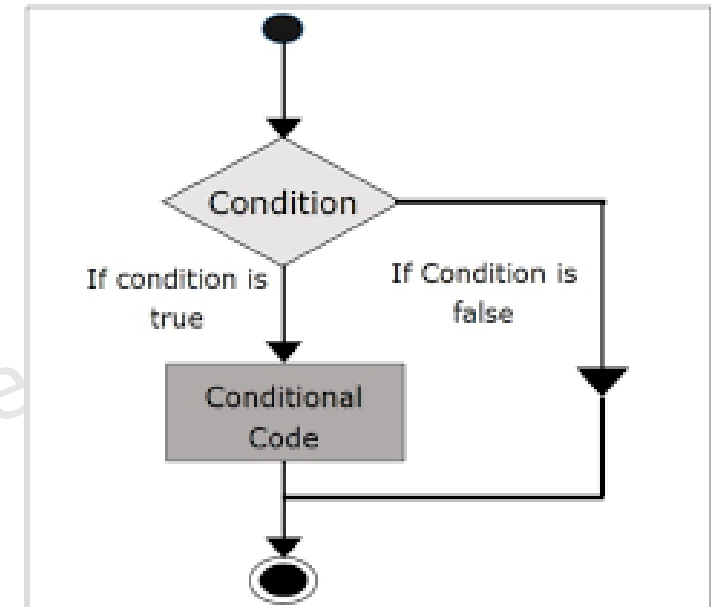
If .. Else .. Elseif....statements

Way to perform a flow control operation

Comparison to determine what kind of action should take place based on a condition.

```
$x = 30
```

```
if($x -eq 30){  
    write-host("This is if statement")  
}else {  
    write-host("This is else statement")  
}
```



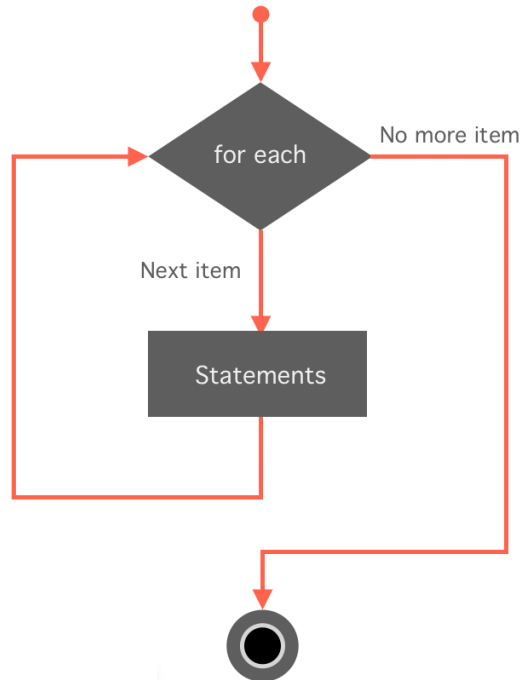
For each loop

Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>

- A language construct for stepping through (iterating) a series of values in a collection of items.



Format:

```
foreach ($i in $arrays)
```



Powershell 4 Automation

Out-File

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>

- Writing output directly to a text file

```
Out-File  
[-FilePath] <string>  
[-Append]  
[-Force]
```



Powershell 4 Automation

Out - gridview

The **Out-GridView** cmdlet sends the output from a command to a grid view window where the output is displayed in an interactive table.

Get-Process | Out-GridView

Filter

+ Add criteria ▼

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
284	17	6016	1432	0.28	4,540	1	ApplicationFrameHost
308	12	1868	1548		360	0	csrss
282	19	1968	2536		476	1	csrss
349	31	13256	9820		2,220	0	dfsrs
157	12	2204	1984		2,368	0	dfssvc
215	13	3616	3296		3,012	0	dllhost
130	8	1724	1436	0.03	5,552	1	dllhost
10,322	8343	129...	3560		2,212	0	dns
453	42	49408	57396		944	1	dwm
1,679	79	33772	78704	10.05	1,012	1	explorer
155	9	1532	1060		4,044	0	GoogleCrashHandler
136	8	1532	836		4,052	0	GoogleCrashHandle...
0	0	0	4		0	0	Idle
115	12	1916	1376		2,196	0	ismserv
1,585	145	46640	37212		604	0	lsass
703	29	30472	9412		2,136	0	Microsoft.ActiveDire...
242	12	2836	2312		4,816	0	MpCmdRun
190	13	2976	1848		2,940	0	msdtc
523	66	151...	137...		2,300	0	MsMpEng
1,004	65	177	222	25.77	4,202	1	powershell.exe



Export-Csv

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>

Get-Process | Export-Csv -Path .\Processes.csv

Get-Process | Export-Csv -Path .\Processes.csv -NoTypeInfo

Powershell4U - <https://www.powershell4u.com/>



Powershell 4 Automation

ConvertTo-HTML

Converts .NET objects into HTML that can be displayed in a Web browser.

Syntax

`ConvertTo-Html -InputObject (Get-Date)`

`Get-EventLog -LogName "windows PowerShell" | ConvertTo-Html | Out-File pslog.htm`

`invoke-item pslog.htm`





Let's code



Execution Policy : Protection from unauthorized scripts



Execution Policy

Restricted

Scripts won't run. (Default setting)

RemoteSigned

Locally-created scripts will run. Scripts that were created on another machine will not run unless they are signed by a trusted publisher.

AllSigned

Scripts will only run if signed by a trusted publisher (including locally-created scripts).

Unrestricted

All scripts will run regardless of who created them and whether or not they are signed.

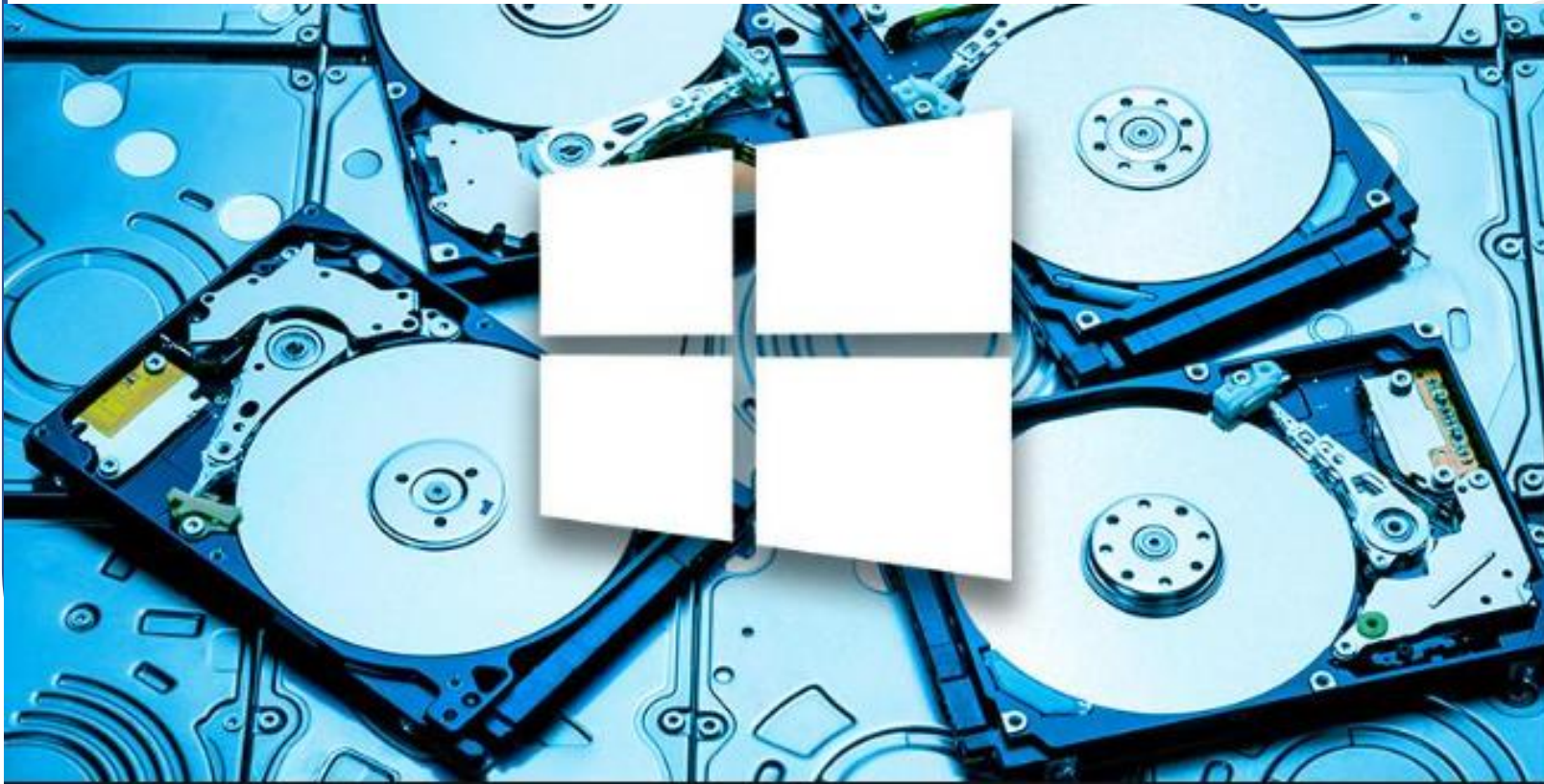


Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

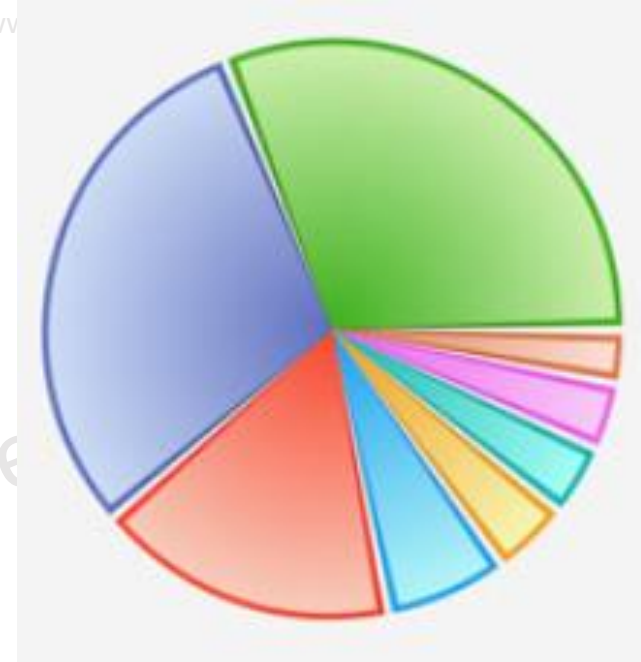
<https://www.facebook.com/vishnugupthannairu>

Windows drive space analysis using powershell



Powershell 4 Automation

Space utilization analysis using powershell



Get-PSDrive

Get-WMIObject LogicalDisk



File Handling : in Powershell

- Text File
- CSV File
- XML File



File Handling : in Powershell : Advantages

- Easy Management of data.
- Avoid rewriting the script each time.
- Scripting knowledge not required for editing the files.

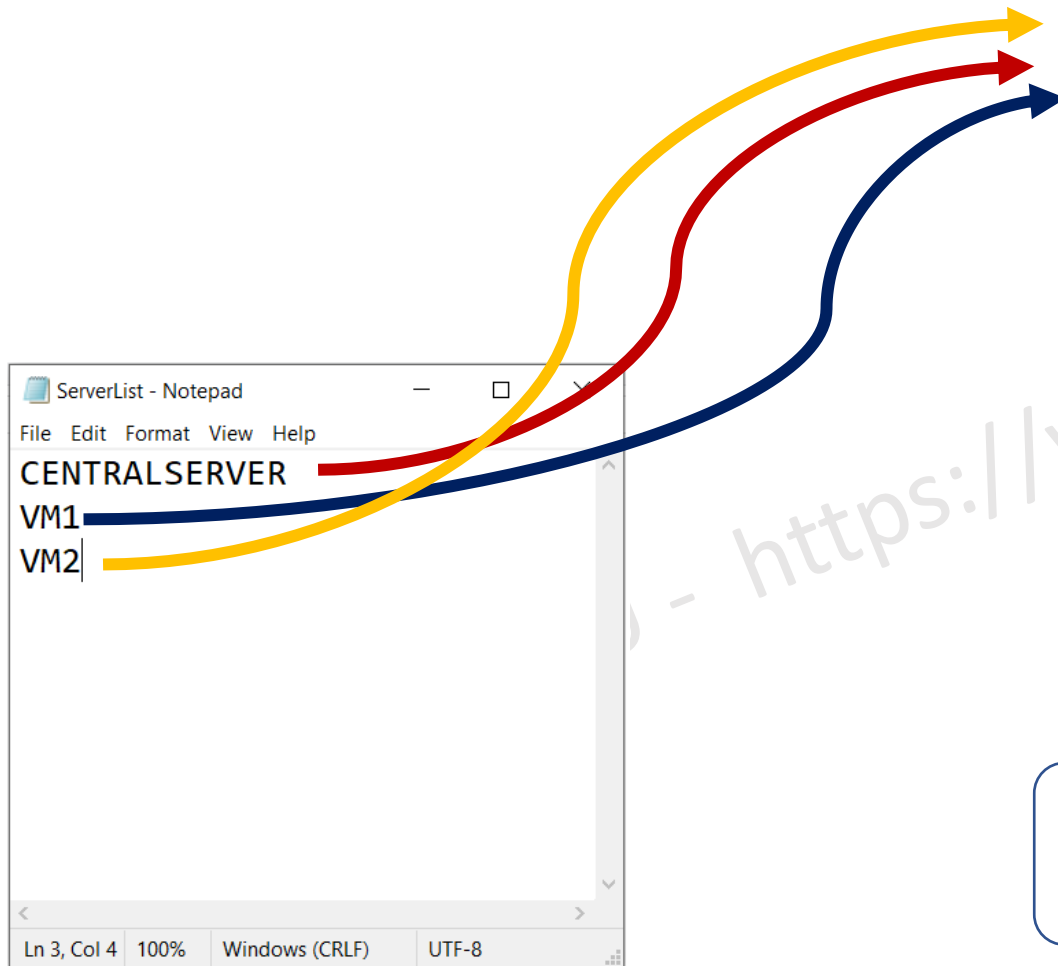


File Handling : Text Files

Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>



Foreach (\$server in \$serverlist)



Output after script execution in the servers
CENTRALSERVER, VM1 and VM2



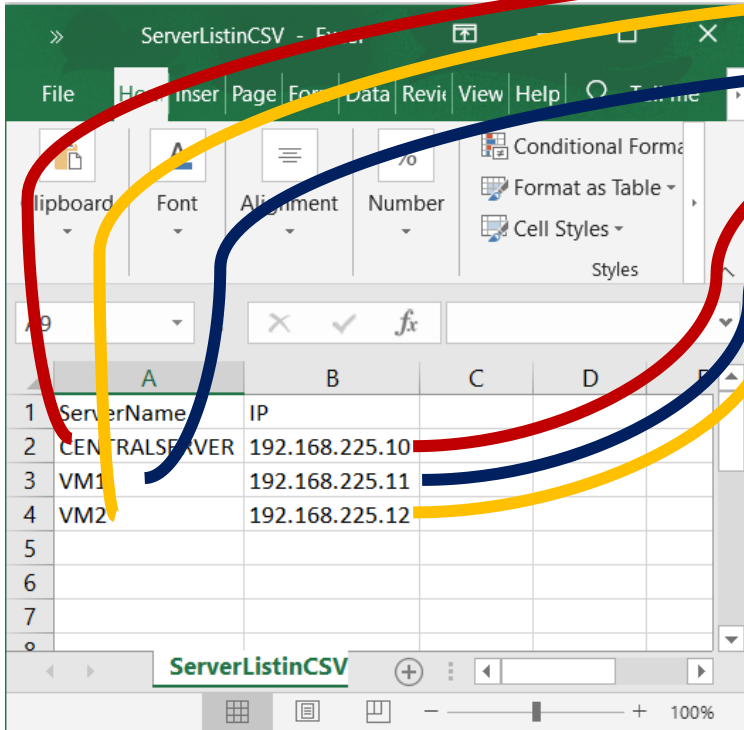
Powershell 4 Automation

File Handling : CSV Files

Powershell4U - <https://www.powershell4u.com/>

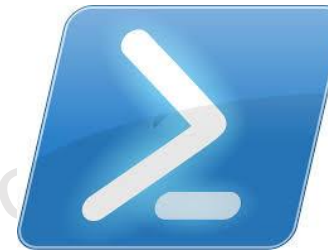
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>



ServerName	IP
CENTRALSERVER	192.168.225.10
VM1	192.168.225.11
VM2	192.168.225.12

Foreach (\$server in \$serverlist)



Output after script execution in the servers
CENTRALSERVER, VM1 and VM2



Powershell 4 Automation

File Handling : XML Files

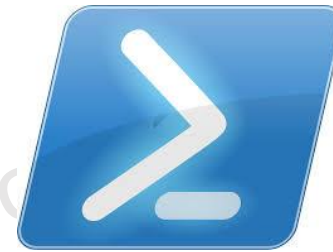
Powershell4U - <https://www.powershell4u.com/>

<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>

<https://www.facebook.com/vishnugupthannairu>

```
ServerList_XML - Notepad
File Edit Format View Help
<?xml version="1.0"?>
<ServerList>
  <Server>
    <Name>CENTRALSERVER</Name>
    <IP>192.168.225.10</IP>
    <Location>Asia</Location>
  </Server>
  <Server>
    <Name>VM1</Name>
    <IP>192.168.225.11</IP>
    <Location>USA</Location>
  </Server>
  <Server>
    <Name>VM2</Name>
    <IP>192.168.225.12</IP>
    <Location>INDIA</Location>
  </Server>
</ServerList>
```

Foreach (\$server in \$serverlist)



Output after script execution in the servers
CENTRALSERVER, VM1 and VM2



Powershell 4 Automation

What is an XML File

Extensible Markup Language (XML) is used to describe data stored in a specific format.

The XML format stores data in a structure that is machine-readable and human-readable.

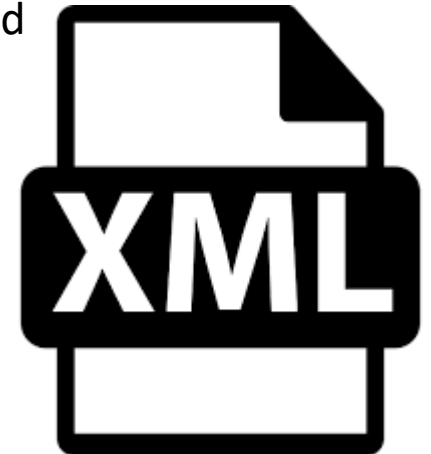
XML tags identify the data and are used to store and organize the data

Plain text files that use custom tags to describe the structure.

XML files have become a standard way of storing and transferring data between programs and over the Internet.



Powershell 4 Automation



XML File format

Below xml file shows how to store a server in the server list

```
<ServerList>  
  <Server>  
    <Name>CENTRALSERVER</Name>  
    <IP>192.168.225.10</IP>  
    <Location>Asia</Location>  
  </Server>  
</ServerList>
```

Root Tag



Powershell 4 Automation



XML File format

Below xml file shows how to store a server in the server list

```
<ServerList>  
  <Server>  
    <Name>CENTRALSERVER</Name>  
    <IP>192.168.225.10</IP>  
    <Location>Asia</Location>  
  </Server>  
</ServerList>
```

1. Structure

2. Data



Powershell 4 Automation



XML File format

Below xml file shows how to store a server in the server list

```
<ServerList>
  <Server>
    <Name>CENTRALSERVER</Name>
    <IP>192.168.225.10</IP>
    <Location>Asia</Location>
  </Server>
  <Server>
    <Name>VM1</Name>
    <IP>192.168.225.10</IP>
    <Location>Asia</Location>
  </Server>
</ServerList>
```

Central Server details

VM1 server details



P4A

Powershell 4 Automation



XML File format

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>

1. Root tags and sub tags
2. Case Sensitive
3. Every Opening tag should have a close tag.



Powershell 4 Automation



Import-Csv Cmdlet

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>

Creates table-like custom objects from the items in a comma-separated value (CSV) file.



Powershell 4 Automation

Send Alert mail

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>



Server going to crash



Alert triggering

Sending Mail to Admins

Send-MailMessage



Powershell 4 Automation

Powershell4U - <https://www.powershell4u.com/>
<https://www.linkedin.com/in/vishnu-gupthan-nair-09a12b31/>
<https://www.facebook.com/vishnugupthannairu>

Let's Automate



Powershell 4 Automation

Send-MailMessage Format

```
Send-MailMessage  
[-Attachments <String[]>  
[-Bcc <String[]>  
[[-Body] <String>  
[-BodyAsHtml]  
[-Cc <String[]>  
-From <String>  
[[-SmtpServer] <String>  
[-Priority <MailPriority>  
[-ReplyTo <String[]>  
[[-Subject] <String>  
[-To] <String[]>  
[-Credential <PSCredential>  
[-UseSsl]  
[-Port <Int32>
```





P4A

Powershell 4 Automation

Automation of installation SQL Server service packs in multiple servers using powershell

