

Course 10961B:

## Automating Administration with Windows PowerShell

**Course Length:**

5 Days

### Overview

Learn how with Windows PowerShell 3.0, you can remotely manage single or multiple Windows-based servers and automate day-to-day management and administration tasks.

This five-day course provides students with the fundamental knowledge and skills to use Windows PowerShell 3.0 for administering and automating administration of Windows based servers. It focuses on primary Windows PowerShell command-line features and techniques, and will provide prerequisite skills supporting many different Microsoft products. This includes Windows Server, Windows Client, Exchange Server, SharePoint Server, SQL Server, System Center, and more. In keeping with that goal, this course will not focus on any one of those products, although Windows Server (which is the common platform for all of those) will serve as the example for the techniques being taught.

In this five-day course you will learn to execute and monitor scripts more efficiently through more robust session connectivity, workflow capabilities, improved job scheduling, and Windows PowerShell Web Access. Learn Windows PowerShell with greater ease through improved cmdlet discovery and simplified, consistent syntax across all cmdlets. Write Windows PowerShell scripts quicker and more intuitively through the new Integrated Scripting Environment (ISE) that enables script sharing, which connects IT pros to a larger Windows PowerShell user community. Learn all this and more in this five-day Microsoft Official Course in Windows PowerShell v3.0

### Target Student

This course is intended for IT Professionals already experienced in general Windows Server and Windows Client administration or already experienced in administering and supporting Application servers and services including applications like Exchange, SharePoint, and SQL. It is broadly intended for students who want to use Windows PowerShell to automate administrative tasks from the command line, using any Microsoft or independent software vendor (ISV) product that supports Windows PowerShell manageability.

This course is not intended to be a scripting or programming course, and includes only basic coverage of scripting and programming topics. Students are not expected to have prior scripting or programming experience, and are not expected to have prior Windows PowerShell experience

### Objectives

After completing this course, students will be able to:

- Understand the basic concepts behind Windows PowerShell
- Work with the Pipeline
- Understand How the Pipeline Works
- Use PSProviders and PSDrives
- Format Output
- Use WMI and CIM
- Prepare for Scripting
- Moving From a Command to a Script to a Module
- Administer Remote Computers
- Put the various Windows PowerShell components together
- Use Background Jobs and Scheduled Jobs
- Use Advanced PowerShell Techniques and Profiles

### Course Content

Module 1: Getting Started with Windows PowerShell

This module introduces students to Windows PowerShell, its purpose and history. The module will also cover the basics of using the shell, including the help system, command syntax, command discovery explaining the use of the two built-in host applications.

Lessons

Overview and Background

Finding and Learning Commands

Running Commands

Lab: Configuring Windows PowerShell

Configure the Windows PowerShell Console Application

Configure the Windows PowerShell ISE Application

Lab: Finding and Running Basic Commands

Finding Commands

Finding and Running Commands

Using "About" Files

After completing this module, students will be able to:

Open and configure Windows PowerShell

Discover, learn, and run Windows PowerShell commands

Run commands by using correct command and parameter syntax

Module 2: Working with the Pipeline

This module covers the Windows PowerShell pipeline along with a number of additional techniques and commands, including customizing command output, exporting and converting data, sorting objects, filtering objects, and enumerating objects allowing for the overall retrieval, manipulation and displaying of data.

Lessons

Understanding the Pipeline

Selecting, Sorting, and Measuring Objects

Converting, Exporting, and Importing Objects

Filtering Objects Out of the Pipeline

Enumerating Objects in the Pipeline

Lab: Using the Pipeline

Selecting and Sorting Data

Lab: Converting, Exporting, and Importing Objects

Converting Objects

Importing and Exporting Objects

Lab: Filtering Objects

Filtering Objects

Lab: Enumerating Objects

Enumerating Objects

After completing this module, students will be able to:

Describe the purpose of the Windows PowerShell pipeline

Manipulate objects in the pipeline

Convert, export, and import objects

Filter objects out of the pipeline

Enumerate objects in the pipeline

Module 3: Understanding How the Pipeline Works

This module explains the underlying details of how Windows PowerShell passes objects from command to command within the pipeline. Having seen it in action in the previous module will now get to see some of the theory under the hood. The emphasis will be on two specific techniques used by the shell and students will learn to explain the pipeline operation, predict command behavior and allows them construct more useful, predictable commands.

Lessons

Passing Data in the Pipeline By Value

Passing Data in the Pipeline By Property Name

Lab: Working with Pipeline Parameter Binding

Predicting Pipeline Behavior

After completing this module, students will be able to:

Pass data by using the ByValue technique

Pass data by using the ByPropertyName technique

Module 4: Using PSProviders and PSDrives

This module explains the purpose and use of Windows PowerShell PSProviders and PSDrives, and shows students how to use these useful components for administrative tasks. Students will also learn to use the `-item*` commands to manipulate items within a PSDrive.

Lessons

Using PSProviders

Using PSDrives

Lab: Using PSProviders and PSDrives

Create a New Folder

Create a New PSDrive

Create a New Registry Key

Create a New Registry Setting

Modify a WS-Management Setting

After completing this module, students will be able to:

Explain the purpose and use of PSProviders

Explain the purpose and use of PSDrives

Module 5: Formatting Output

This module demonstrates how to format command output and how to create custom output elements.

Lessons

Using Basic Formatting

Using Advanced Formatting

Redirecting Formatted Output

Lab: Formatting Output

Formatting Command Output

Reproducing Specified Output

After completing this module, students will be able to:

Format command output by using basic formatting commands

Format command output by using advanced formatting options

Redirect formatted output

Module 6: Querying Management Information by Using WMI and CIM

This module explains Windows Management Instrumentation (WMI) and Common Information Model (CIM), and shows students how to retrieve and in some cases modify management information about local and remote computers.

Lessons

Understanding WMI and CIM

Querying Data with WMI and CIM

Making Changes by Using WMI and CIM

Lab: Working with WMI and CIM

Querying Information by Using WMI

Querying Information by Using CIM

Invoking Methods

After completing this module, students will be able to:

Explain the differences between WMI and CIM

Query management information by using WMI and CIM

Invoke methods by using WMI and CIM

Module 7: Preparing for Scripting

This module prepares students for writing scripts with Windows PowerShell, covering the Windows PowerShell security model and the use of variables.

Lessons

Using Variables

Scripting Security

Lab: Working with Security in Windows PowerShell

Configure Security

After completing this module, students will be able to:

Create, use, and manage variables

Configure shell scripting security

Module 8: Moving From a Command to Script to Module

This module shows students how to take a command that runs well in the console and turn it into a parameterized, reusable script, and how to evolve that script into a standalone script module. Students will learn the foundations needed to create their own reusable tools.

#### Lessons

- Moving From Command to Script
- Moving From Script to Function to Module
- Implementing Basic Error Handling
- Using Basic Scripting Constructs
- Exploring Other Scripting Features
- Lab: Moving From Command to Script
- Test the Command
- Parameterize Changing Values
- Add Verbose Output
- Add Comment-Based Help
- Lab: Moving From Script to Function to Module
- Convert the Script to a Function
- Save the Script as a Script Module
- Add Debugging Breakpoints
- Lab: Implementing Basic Error Handling
- Add Error Handling to a Function
- Add Error Handling to a New Function
- Lab: Creating an Advanced Function
- Test an Existing Command
- Create a Parameterized Function
- Handle Multiple Targets
- Add Error Handling

After completing this module, students will be able to:

- Move from Command to Script
- Move from Script to Function to Module
- Implement basic error handling
- Implement basic scripting constructs
- Explain additional advanced Windows PowerShell scripting features

#### Module 9: Administering Remote Computers

This module explains Windows PowerShell remoting, and shows students how to configure and use remoting to manage multiple remote computers.

#### Lessons

- Using Basic Remoting
- Using Advanced Remoting Techniques
- Using Remoting Sessions
- Lab: Using Basic Remoting
- Enable Remoting on the Local Computer
- Performing One-to-One Remoting
- Performing One-to-Many Remoting
- Lab: Using Remoting Sessions
- Using Implicit Remoting
- Multicomputer Management

After completing this module, students will be able to:

- Describe remoting architecture and security, manually enable remoting, and use remoting for one-to-one and one-to-many connections
- Pass local variables to remote computers
- Create and manage persistent remoting sessions, and use implicit remoting

#### Module 10: Putting it All Together

This module offers students an opportunity to use everything they have learned so far. Students will discover, learn, and run commands that perform a complex, real-world administrative task.

#### Lessons

- Provisioning a New Server Core Instance
- Lab: Provisioning a New Server Core Installation
- Create a Parameterized Script
- Get the Dynamic IP Address of the New Server Core Computer

Create a DHCP Reservation for the Server Core Instance  
Modify the Local TrustedHosts List  
Add a Role to the Server Core Instance  
Add the Server Core Instance to the Domain  
Test the Completed Script  
After completing this module, students will be able to:  
Plan your Windows PowerShell Script  
Configure Server Core computers using Windows PowerShell

#### Module 11: Using Background Jobs and Scheduled Jobs

In this module students will learn to create and manage background jobs and scheduled jobs.

##### Lessons

Using Background Jobs

Using Scheduled Jobs

Lab: Using Background Jobs

Starting Jobs

Managing Jobs

Lab: Using Scheduled Jobs

Creating a Scheduled Job

After completing this module, students will be able to:

Create and manage Background Jobs

Create and manage Scheduled Jobs

#### Module 12: Using Profiles and Advanced PowerShell Techniques

This module covers a variety of additional advanced Windows PowerShell features and techniques including additional comparison operators use of alternate credentials, creation of profile scripts, manipulation of strings and date objects.

##### Lessons

Using Advanced PowerShell Techniques

Creating Profile Scripts

Working With Alternative Credentials

Lab: Practicing Advanced Techniques

Using Advanced Techniques

Using Alternative Credentials

Create a Profile Script

After completing this module, students will be able to:

Manipulate data and objects by using advanced techniques and operators

Create and manage profile scripts

Connect to remote computers by using alternative credentials

Before attending this course, students must have:

Previous Windows Server and Windows Client management knowledge and hands on experience.

Experience installing and configuring Windows Server into existing enterprise environments, or as standalone installations.

Knowledge and experience of network adapter configuration, basic Active Directory user administration, and basic disk configuration.

Knowledge and hands on experience specifically with Windows Server 2012 and Windows 8 would be of benefit but is not essential.