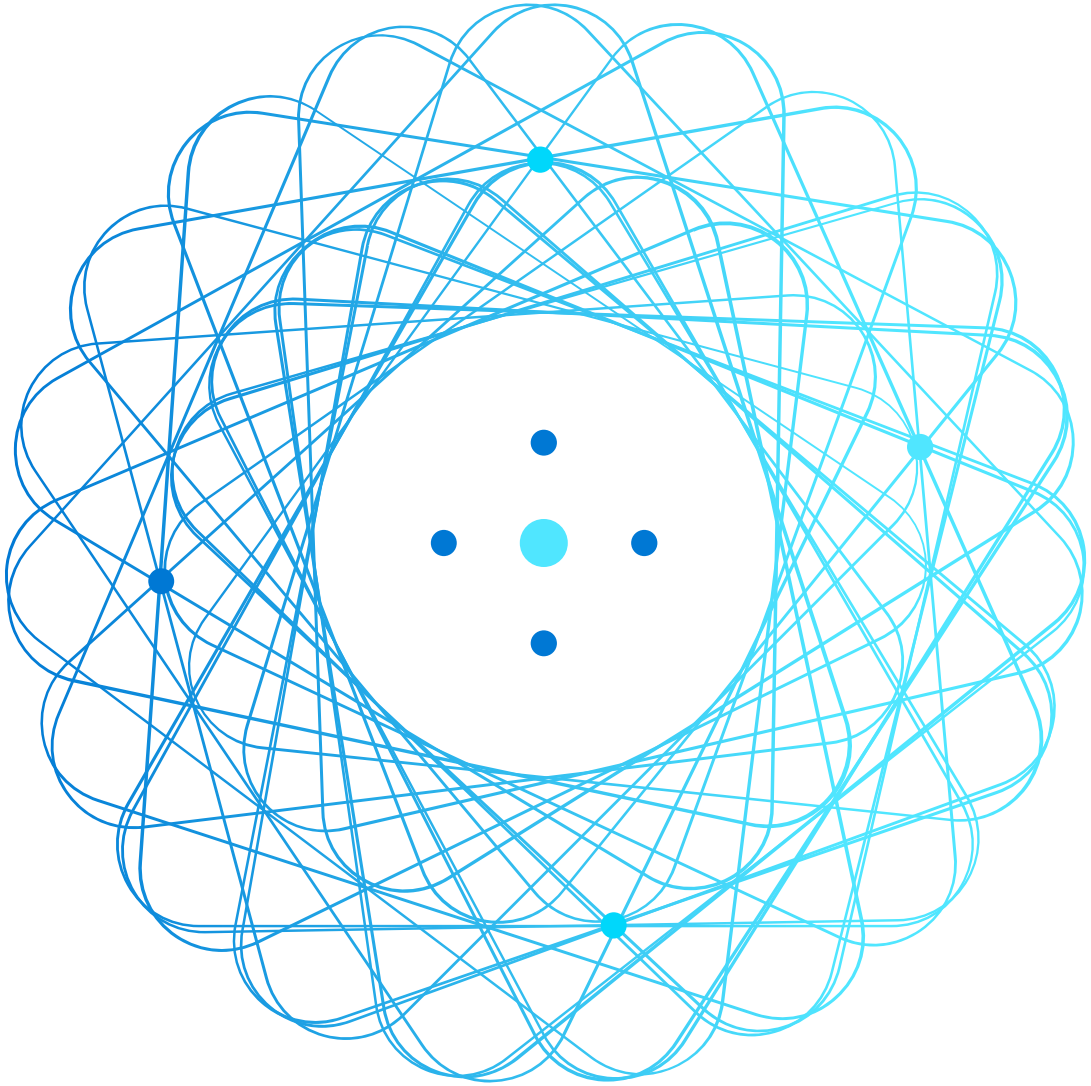
Microsoft Azure

AZ-040 Automating Administration with PowerShell



Course outline

Learning Path 1: Getting started with Windows PowerShell
Learning Path 2: Windows PowerShell for local systems administration
Learning Path 3: Working with the Windows PowerShell pipeline
Learning Path 4: Using PSProviders and PSDrives
Learning Path 5: Querying management information by using CIM and WMI
Learning Path 6: Working with variables, arrays, and hash tables
Learning Path 7: Windows PowerShell scripting
Learning Path 8: Administering remote computers with Windows PowerShell
Learning Path 9: Managing Azure resources with PowerShell
Learning Path 10: Managing Microsoft 365 services with PowerShell
Learning Path 11: Using background jobs and scheduled jobs

Learning Path 11: Create and manage background jobs and scheduled jobs in Windows PowerShell

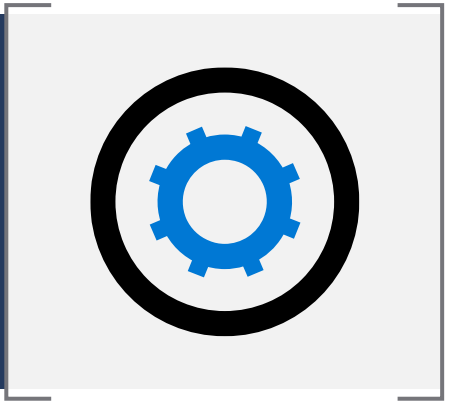
Overview

If you use the Windows PowerShell console to start a task whose execution takes a long time, you will not be able to run other commands from the same console until the task completes. Background jobs allow you to use the same console to work with other tasks while the long-running one is active. In this Learning Path, you'll learn about the Windows PowerShell jobs.

Modules:

- Create and manage background jobs using Windows PowerShell
- Create and manage scheduled jobs using Windows PowerShell

Section break 1



Create and manage background jobs using Windows PowerShell

Module overview

When you run a command as a background job, Windows PowerShell performs the task asynchronously in its own thread. Even if the job takes a long time to complete, you regain access to the PowerShell prompt immediately.
This allows you to run other commands while the job runs in the background.

Units:

- What are background jobs?
- Starting jobs
- Managing jobs
- Retrieving results for running jobs
- Demonstration: Using background jobs

What are background jobs?

- Run commands in the background
- Store command results in memory for retrieval
- Three basic job types:
  - Local
  - Remoting
  - CIM/WMI
- Each job type has different characteristics

Starting jobs

- Local jobs:

```
Start-Job –ScriptBlock { Dir }
```

- Remoting jobs:

```
Invoke-Command –ScriptBlock { Get-Service } -ComputerName LON-DC1 –AsJob
```

- CIM/WMI jobs:

```
Start-Job  -ScriptBlock {Get-CimInstance –ClassName Win32_ComputerSystem}
Get-WmiObject –Class Win32_BIOS-ComputerName LON-DC1 -AsJob
```

Remove-AzResourceGroup -Name RG1 -NoWait -Force

Managing jobs

Use the following commands:

- **Get-Job**
  - Add *–ID* to retrieve a specific job by ID
  - Add *–Name* to retrieve a specific job by name
  - To get a list of child jobs, use the following syntax:

```
Get-Job –ID <parent_ID> -IncludeChildJobs
```

- **Stop-Job**
- **Remove-Job**
- **Wait-Job**

Retrieving results for running jobs

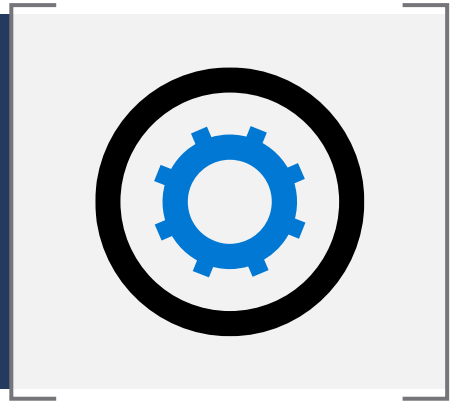
- Use **Receive-Job**:
  - Pipe jobs to it to specify jobs
  - Use *–ID* to specify by job ID
  - Use *–Name* to specify by job name
- Add *–Keep* to retain a copy of the results in memory. Otherwise, results aren't retained in memory
- Receiving results from a parent job will result in receiving results from all child jobs

Demonstration: Using background jobs

In this demonstration, you'll learn how to create and manage local and remoting jobs.

1. Start local and remoting jobs.
2. Manage jobs.
3. Receive job results.

Section break 2



Create and manage scheduled jobs using Windows PowerShell

Linux:

Crontab

Windows

schtasks

PS

Module overview

This Module covers scheduled jobs, which are similar to background jobs because they run asynchronously in the background. In Windows PowerShell, scheduled jobs are essentially scheduled tasks that follow all the same rules for actions, triggers, and other features, and run Windows PowerShell scripts by design.

Units:

- Running Windows PowerShell scripts as scheduled tasks
- Demonstration: Using a Windows PowerShell script as a scheduled task
- What are scheduled jobs?
- Job options and job triggers
- Creating a scheduled job
- Retrieving scheduled job results
- Demonstration: Using scheduled jobs

Running Windows PowerShell scripts as scheduled tasks

- Windows PowerShell scripts can run in **Task Scheduler**:
  - Can use all options of **Task Scheduler** in a graphical user interface
- A scheduled task consists of:
  - **Action**
  - **Principal**
  - **Trigger**
  - **Additional settings**
- To review the complete list of commands, run the following command:

```
Get-Command –Module ScheduledTasks
```

Demonstration: Using a Windows PowerShell script as a scheduled task

In this demonstration, you'll learn how to create and run a Windows PowerShell script as a scheduled task.

What are scheduled jobs?

- Scheduled jobs are a cross between background jobs and **Task Scheduler** tasks
- They have three components:
  - Job definition
  - Job options
  - Job triggers
- To review all scheduled job commands, use:

```
Get-Command –Module PSScheduledJob
```

Job options and job triggers

- Use **New-ScheduledJobOption** to create an option object.
- Parameters correspond to options in the **Task Scheduler** GUI and include:
  - *–RequireNetwork*
  - *–RunElevated*
  - *–WakeToRun*
  - *–HideInTaskScheduler*
- Use **New-JobTrigger** to create a trigger object.
- Five basic types of triggers:
  - *–Once*
  - *–Weekly*
  - *–Daily*
  - *–AtLogOn*
  - *–AtStartUp*

Creating a scheduled job

- Use **Register-ScheduledJob** to create and register a new scheduled job.
- Windows PowerShell creates the job definition XML file on disk.
- Parameters include:
  - **–***Name*
  - *–ScriptBlock* or *–FilePath*
  - *–Credential*
  - *–MaxResultCount*
  - *–ScheduledJobOption* (job option object)
  - *–Trigger* (job trigger object)

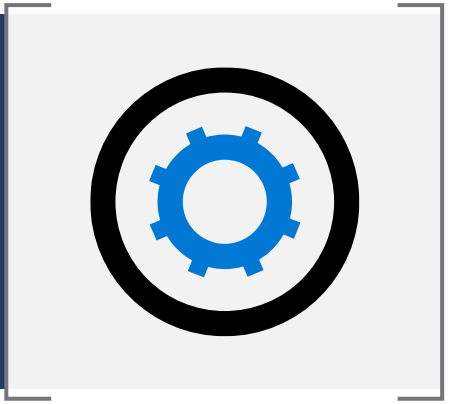
Retrieving scheduled job results

- Run **Get-Job** to review a list of **PSScheduledJob** jobs:
  - Each represents a running of the scheduled job.
  - Provides access to the job results.
- Run **Receive-Job** to retrieve results.
- Run **Remove-Job** to delete results and the job object.

Demonstration: Using scheduled jobs

In this demonstration, you'll learn how to create, run, and retrieve the results from a scheduled job.

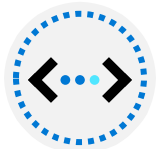
Section break 3



Lab: Jobs management with PowerShell

Exercise 1: Starting and managing jobs

Exercise 2: Creating a scheduled job



Sign-in information for the exercise(s):

Virtual machines:

- **AZ-040T00A-LON-DC1**
- **AZ-040T00A-LON-SVR1**
- **AZ-040T00A-LON-CL1**

Username: **Adatum\Administrator**

Password: **Pa55w.rd**

Lab scenario

Background jobs provide a useful way to run multiple commands simultaneously and long-running commands in the background. In this lab, you'll learn to create and manage two of the three basic kinds of jobs.

You'll create and configure two scheduled jobs. You'll also create a scheduled task using a Windows PowerShell script that searches for and removes disabled accounts from a certain security group.

Lab-review questions

Get-CIMInstance doesn't have an *–AsJob* parameter. Why? How would you use **Get-CimInstance** in a job?

Is it possible to create a scheduled job without creating a job option object?

Lab-review answers

Get-CIMInstance doesn't have an *–AsJob* parameter. Why? How would you use **Get-CimInstance** in a job?

Microsoft is moving toward a standardized use pattern where **Invoke-Command** is used to run commands on remote computers and to manage that process in the background. You can use **Get-CIMInstance** inside the script block of **Invoke-Command** or inside the script block for **Start-Job**.

Is it possible to create a scheduled job without creating a job option object?

Yes. The *–ScheduledJobOption* parameter of **Register-ScheduledJob** is optional. You need to create a scheduled job option only if you require one of its features.