DOCUMENTATION: Tag-Based Script Execution Using Azure Automation and Azure VM Agent

1. Overview

This solution enables running a shell script *inside Linux virtual machines* automatically based on:

1. **One-time schedule tag** (RunOnDate)
2. **Weekly schedule tag** (WeeklyRun)

The Azure Automation Account runbook uses **Azure Linux VM Agent(walinuxagent)** to execute the script remotely inside the VM **without SSH**.

This process works for **all VMs in the resourcegroup**, and execution happens only when the conditions configured in the tags are met.
The runbook updates only **LastExecuted**, ensuring no unnecessary tag changes

2. Azure Prerequisites

2.1 Azure Automation Account

Create an Automation Account in Azure.

2.2 Enable System-Assigned Managed Identity

Inside the Automation Account:

- Go to **Identity**
- Turn **System Assigned** → ON
- Save

2.3 Assign Azure Role to Automation Identity

To allow the runbook to read/update VM tags and execute commands:

- Go to **Subscription → Access Control (IAM)**
- Add role assignment
- Select the Automation Account managed identity
- Assign: VM Contributor

This allows read/write operations on VM tags + run commands through Azure VM agent.

3. Prepare the Linux VM(s)

3.1 Ensure Azure VM Agent is Installed

Verify: systemctl status walinuxagent

Service should be **running**.

3.2 Place the Script Inside the VM

Make executable: sudo chmod +x script_path.sh

4. Tag Configuration on VMs

Tag-based execution allows the runbook to know *what* to execute *when*.

4.1 One-Time Execution Tag (RunOnDate)

Format: RunOnDate = 2025-11-10 14:00

- Time is interpreted as **IST**
- The script will run once when this time arrives
- After execution, only LastExecuted updates

4.2 Weekly Execution Tag (WeeklyRun)

Format: WeeklyRun = Sunday 02:00

Meaning:

- Every Sunday at 02:00 IST
- Script will run only once per week
- Uses LastExecuted tag to prevent duplicate runs

5. Runbook Purpose

The runbook:

- Iterates through all VMs in the resource group.
- Reads VM tags.
- Determines whether execution is required.
- Executes script inside VM using Azure VM Agent.

Updates only: **LastExecuted**

- Avoids duplicate execution.
- Skips already completed tasks.
- Supports weekly and one-time schedules.

6. Detailed Runbook Logic

This section explains the decision-making process used by the runbook.

6.1 Time Handling

- Azure Automation runs in **UTC**.
- VM tags store time in **IST (UTC +5:30)**.

Runbook performs:

- Convert IST → UTC (for comparison)
- Convert UTC → IST (for updating LastExecuted)

This ensures correct schedule matching regardless of Automation timezone.

6.2 VM State Validation

Runbook checks if VM is running.

If VM is stopped or deallocated: Script will NOT execute. Next cycle will check again.

6.3 One-Time Execution Logic (RunOnDate)

Step 1 → Check if RunOnDate exists

If not present → skip VM.

Step 2 → Convert RunOnDate (IST → UTC)

Step 3 → Compare with LastExecuted

If:

LastExecuted >= RunOnDate

Script already ran → SKIP

If:

CurrentTime >= RunOnDate

Allowed to run

6.4 Weekly Execution Logic (WeeklyRun)

Format: WeeklyRun = Sunday 02:00

Step 1

Check if today matches the weekly day.

Step 2

Construct today's target time (e.g., Sunday 02:00 IST).

Step 3

If:

LastExecuted >= today's scheduled time

Already executed earlier today → SKIP

Step 4

If:

CurrentTime >= scheduled time

Allowed to run

6.5 Execution Inside VM

Script executed using Azure VM Agent:

Invoke-AzVMRunCommand

Benefits:

- No SSH keys needed
- Works even without public IP
- Highly secure

6.6 After Successful Execution

ONLY this tag is updated: LastExecuted = <current IST timestamp>

- No other tags are modified
- RunOnDate remains intact for audit
- WeeklyRun is untouched

6.7 Execution Failure Behavior

If the VM script fails:

- No tags are modified
- Next scheduled job will retry automatically
- No retry counter is used
- Execution happens only when RunOnDate or WeeklyRun conditions continue to match

7. High-Level Flowchart

```
Start
  ↓
Connect to Azure
  ↓
Fetch all VMs
  ↓
For each VM:
  ↓
Is VM running? → No → Skip
  ↓
Read tags
  ↓
Was RunOnDate met & not executed? → Yes → Run script
  ↓
Was WeeklyRun time met today & not executed? → Yes → Run script
  ↓
If script succeeds → update LastExecuted
  ↓
If fails → leave tags unchanged
  ↓
End
```

8. Benefits of This System

- No cron jobs inside VM
- No SSH required
- Centralized automation
- VM decides its own schedule via tags
- Supports one-time & recurring schedules
- Clean runbook execution
- Zero manual intervention