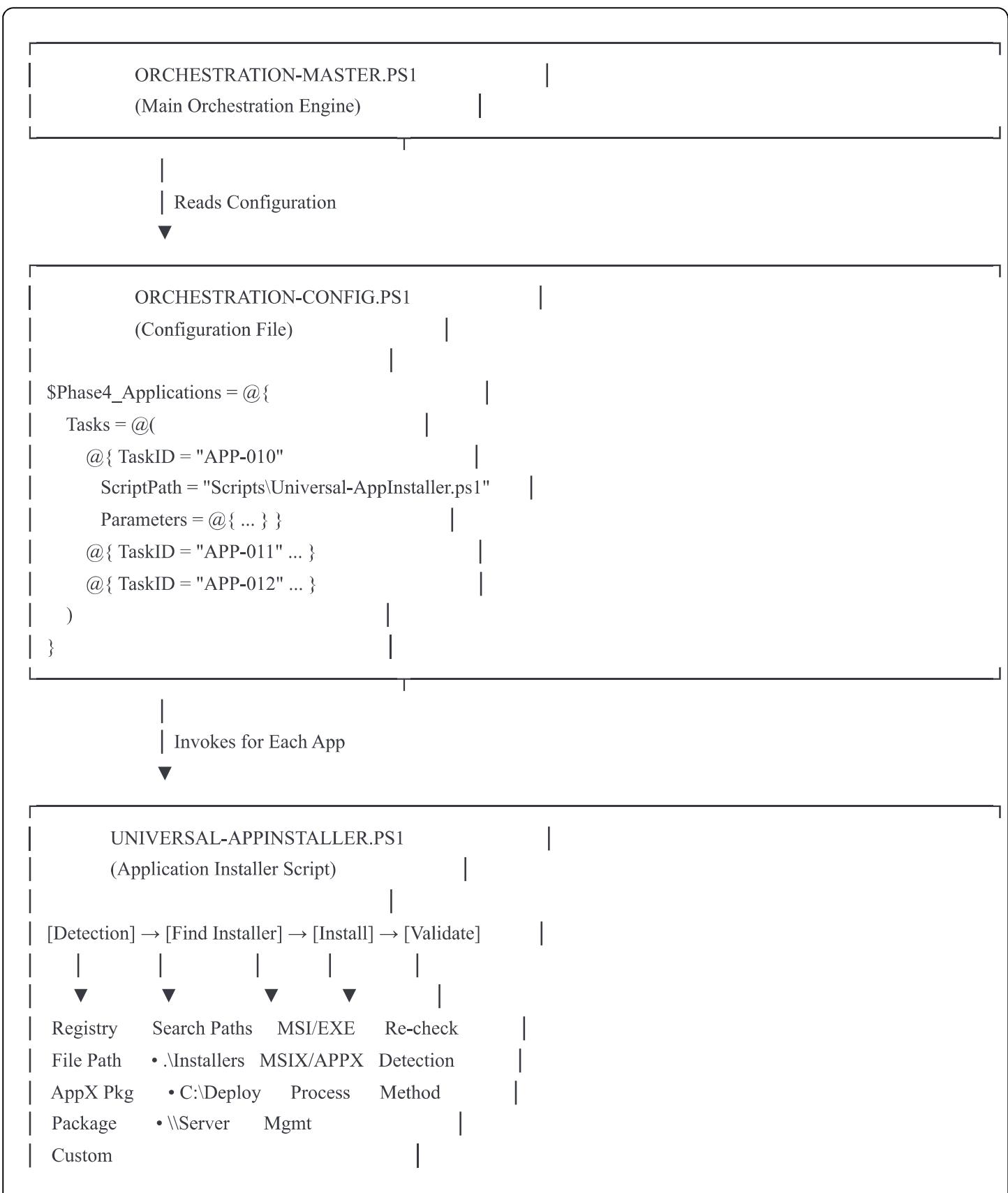


# UNIVERSAL APP INSTALLER - ARCHITECTURE & WORKFLOW

## System Architecture



Writes Logs & Returns Exit Code

C:\ProgramData\OrchestrationLogs\

Orchestration\_COMPUTER\_20241208-143022.log ← Main log  
Apps\  
Install-7-Zip\_20241208-143025.log ← App-specific  
Install-Notepad++\_20241208-143030.log  
Install-VLC\_20241208-143035.log

## Installation Workflow

### Step-by-Step Process for Each Application

START

—[1]— Check if Already Installed (Detection Method)

— YES → Log "Already Installed" → EXIT CODE 10 ✓

— NO → Continue to Step 2

—[2]— Search for Installer File

— Search Paths:

- .\Installers\Apps
- C:\Deploy\Apps
- C:\Installers\Apps
- \$PSScriptRoot..\Installers\Apps
- \\FileServer\Deployment\Apps

— FOUND → Continue to Step 3

— NOT FOUND → Log Error → EXIT CODE 2 ✗

—[3]— Execute Pre-Install Script (Optional)

```

    └─ Run Custom PowerShell if Provided

    └─ [4]— Determine Installer Type
        └─ Explicit (MSI, EXE, MSIX, APPX)
        └─ AUTO (detect from extension)

    └─ [5]— Perform Installation
        └─ MSI → msiexec /i "file.msi" /quiet /norestart
        └─ EXE → Start-Process "file.exe" /S (or custom args)
        └─ MSIX → Add-AppxPackage -Path "file.msix"

        └─ SUCCESS → Continue to Step 6
        └─ FAILURE → Log Error → EXIT CODE 4 X

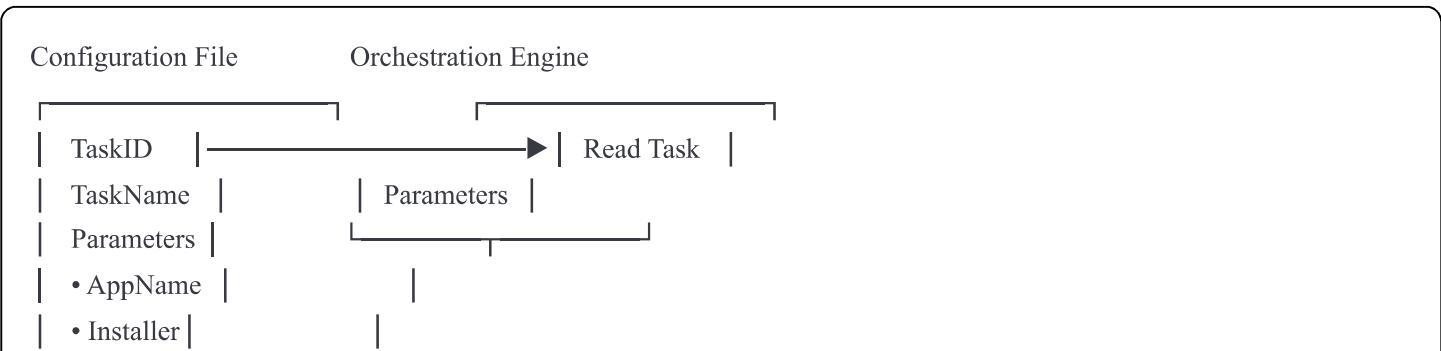
    └─ [6]— Execute Post-Install Script (Optional)
        └─ Run Custom PowerShell if Provided

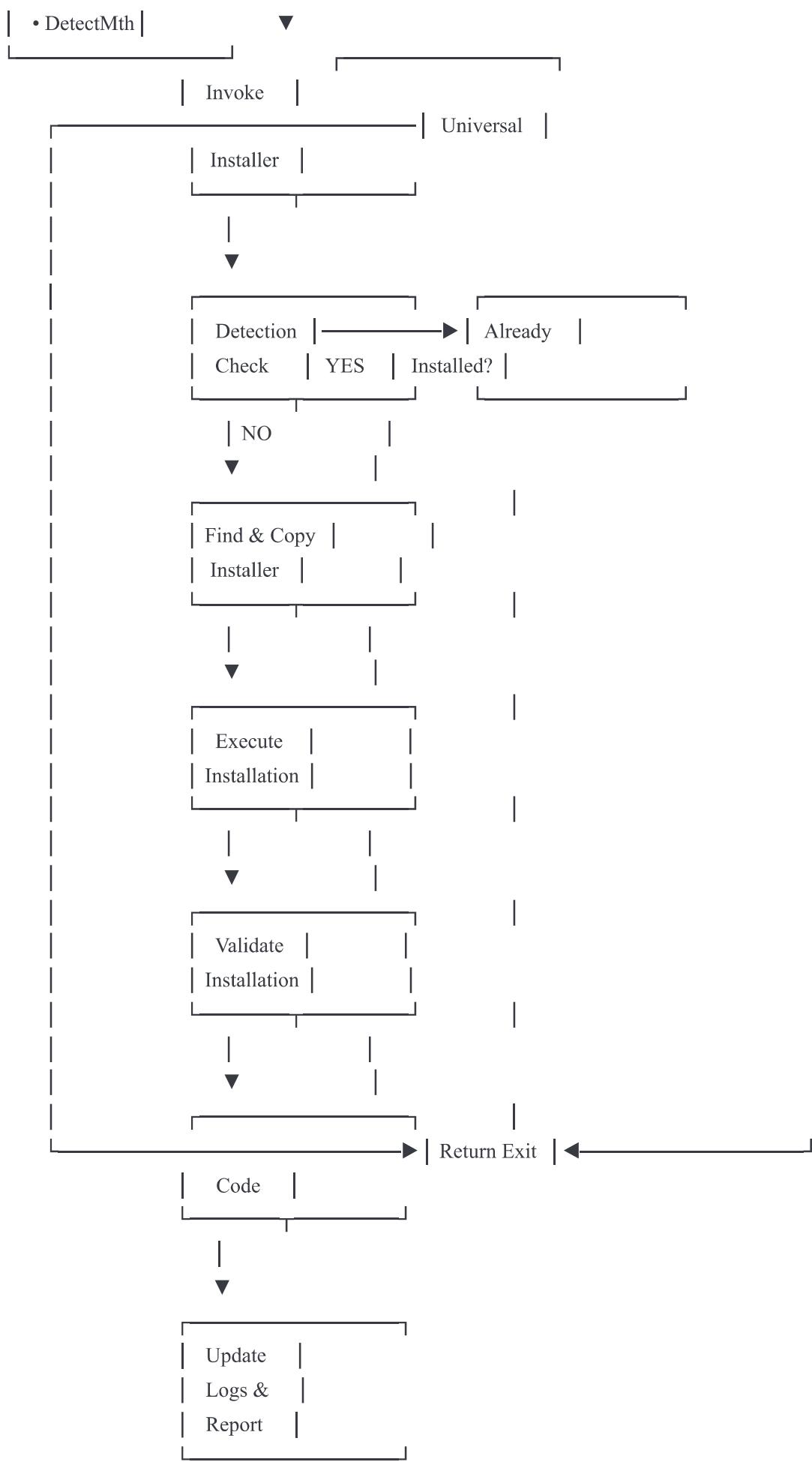
    └─ [7]— Validate Installation
        └─ Re-run Detection Method
        └─ DETECTED → Continue to Step 8
        └─ NOT DETECTED → Log Error → EXIT CODE 5 X

    └─ [8]— Log Success → EXIT CODE 0 ✓

```

## Data Flow Diagram





## Detection Methods Flow

Detection Method Selection



REGISTRY | → Test-Path "HKLM:\SOFTWARE\App"

- |     └ Key Exists?
- |     └ Value Exists?
- |     └ Version Check?

FILE | → Test-Path "C:\Program Files\App\app.exe"

- |     └ File Exists?
- |     └ Version Check?

APPX | → Get-AppxPackage -Name "AppName"

- |     └ Package Found?
- |     └ Version Check?

PACKAGE | → Get-Package -Name "AppName"

- |     └ Package Found?
- |     └ Version Check?

CUSTOM | → Execute Custom ScriptBlock

- |     └ Return \$true/\$false

NONE | → Always return \$false (Force Install)

## Exit Code Flow

Installation Process



Already Installed? | —YES—> EXIT 10 ✓ (Success - No Action)

| NO  
↓

Installer Found? | —NO—> EXIT 2 X (File Not Found)

| YES  
↓

Detection Valid? | —NO—> EXIT 3 X (Detection Failed)

| YES  
↓

Installation OK? | —NO—> EXIT 4 X (Install Failed)

| YES  
↓

Validation OK? | —NO—> EXIT 5 X (Validation Failed)

| YES  
↓

EXIT 0 ✓ (Success)

## Integration with Orchestration

Orchestration-Master.ps1 Execution Flow

Phase 1: Critical Infrastructure

- Windows Updates
- Drivers

└ .NET Framework

Phase 2: Security

- ├ BitLocker
- ├ Firewall
- └ Antivirus

Phase 3: Network

- ├ VPN
- ├ Wi-Fi Profiles
- └ Proxy Settings

Phase 4: Applications ◀— UNIVERSAL INSTALLER USED HERE

- ├ APP-010: Install 7-Zip
  - └ Invoke Universal-AppInstaller.ps1
    - Parameters: AppName="7-Zip", Installer="7z2408-x64.msi"...
    - Exit Code: 0 or 10 → Continue
    - Exit Code: 1-5 → Retry or Fail
- ├ APP-020: Install Notepad++
  - └ Invoke Universal-AppInstaller.ps1
    - Parameters: AppName="Notepad++", Installer="npp.exe"...
- ├ APP-030: Install Adobe Reader
  - └ Invoke Universal-AppInstaller.ps1
- ├ APP-040: Install VLC
  - └ Invoke Universal-AppInstaller.ps1
- ├ APP-050: Install PuTTY
  - └ Invoke Universal-AppInstaller.ps1
- └ ... (more applications)

Phase 5: System Configuration

- ├ Power Settings
- ├ Regional Settings
- └ Time Zone

Phase 6: User Experience

- ├ Desktop Icons
- ├ Start Menu
- └ Taskbar

## Phase 7: Validation

- └ Verify Apps Installed
- └ Test Configurations
- └ Generate Report

## 📁 File System Layout

```
C:\  
└ Deploy\  
    |   └ Orchestration-Master.ps1  
    |   └ Orchestration-Config.ps1  
    |  
    |  
    |   └ Scripts\  
    |       └ Universal-AppInstaller.ps1 ← NEW SCRIPT  
    |       └ Phase1-Critical\  
    |           |   └ WindowsUpdate.ps1  
    |           |   └ Install-Drivers.ps1  
    |       └ Phase2-Security\  
    |           |   └ Configure-BitLocker.ps1  
    |           |   └ Configure-Firewall.ps1  
    |       ...  
    |  
    |  
    |   └ Installers\  
    |       └ Apps\ ← NEW FOLDER  
    |           |   7z2408-x64.msi  
    |           |   npp.8.6.9.Installer.x64.exe  
    |           |   AcroRdrDC2400221005_en_US.exe  
    |           |   vlc-3.0.21-win64.exe  
    |           |   putty-64bit-0.81-installer.msi  
    |           |   ... (more installers)  
    |  
    |  
    └ ProgramData\  
        └ OrchestrationLogs\  
            |   └ Orchestration_COMPUTER_20241208-143022.log  
            |   └ Checkpoint.xml  
            |  
            |  
            └ Apps\ ← NEW FOLDER  
                |   └ Install-7-Zip_20241208-143025.log  
                |   └ Install-Notepad++_20241208-143030.log  
                |   └ Install-AdobeReader_20241208-143035.log
```

```
|--- Install-VLC_20241208-143040.log  
|   |--- ... (per-app logs)
```

## 🎭 Example: 7-Zip Installation Flow

```
[Configuration]  
TaskID: APP-010  
AppName: 7-Zip  
Installer: 7z2408-x64.msi  
Type: MSI  
Args: /quiet /norestart  
Detection: Registry  
Path: HKLM:\SOFTWARE\7-Zip
```



```
[Orchestration Invokes]  
.Universal-AppInstaller.ps1 -AppName "7-Zip" ...
```



```
[Detection Check]  
Test-Path "HKLM:\SOFTWARE\7-Zip"  
Result: NOT FOUND
```



```
[Find Installer]  
Searching:  
✗ .Installers\Apps\7z2408-x64.msi  
✓ C:\Deploy\Apps\7z2408-x64.msi (FOUND)
```



```
[Installation]  
msiexec /i "C:\Deploy\Apps\7z2408-x64.msi" /quiet /norestart  
Process Exit Code: 0 (Success)
```



```
[Validation]  
Test-Path "HKLM:\SOFTWARE\7-Zip"  
Result: FOUND ✓
```



```
[Logging]
```

C:\ProgramData\OrchestrationLogs\Apps\Install-7-Zip\_20241208-143025.log  
[2024-12-08 14:30:25] [INFO] Starting installation of 7-Zip  
[2024-12-08 14:30:26] [INFO] Application not currently installed  
[2024-12-08 14:30:27] [SUCCESS] Installer found  
[2024-12-08 14:30:35] [SUCCESS] Installation completed  
[2024-12-08 14:30:36] [SUCCESS] Validation successful  
[2024-12-08 14:30:36] [SUCCESS] Exit Code: 0



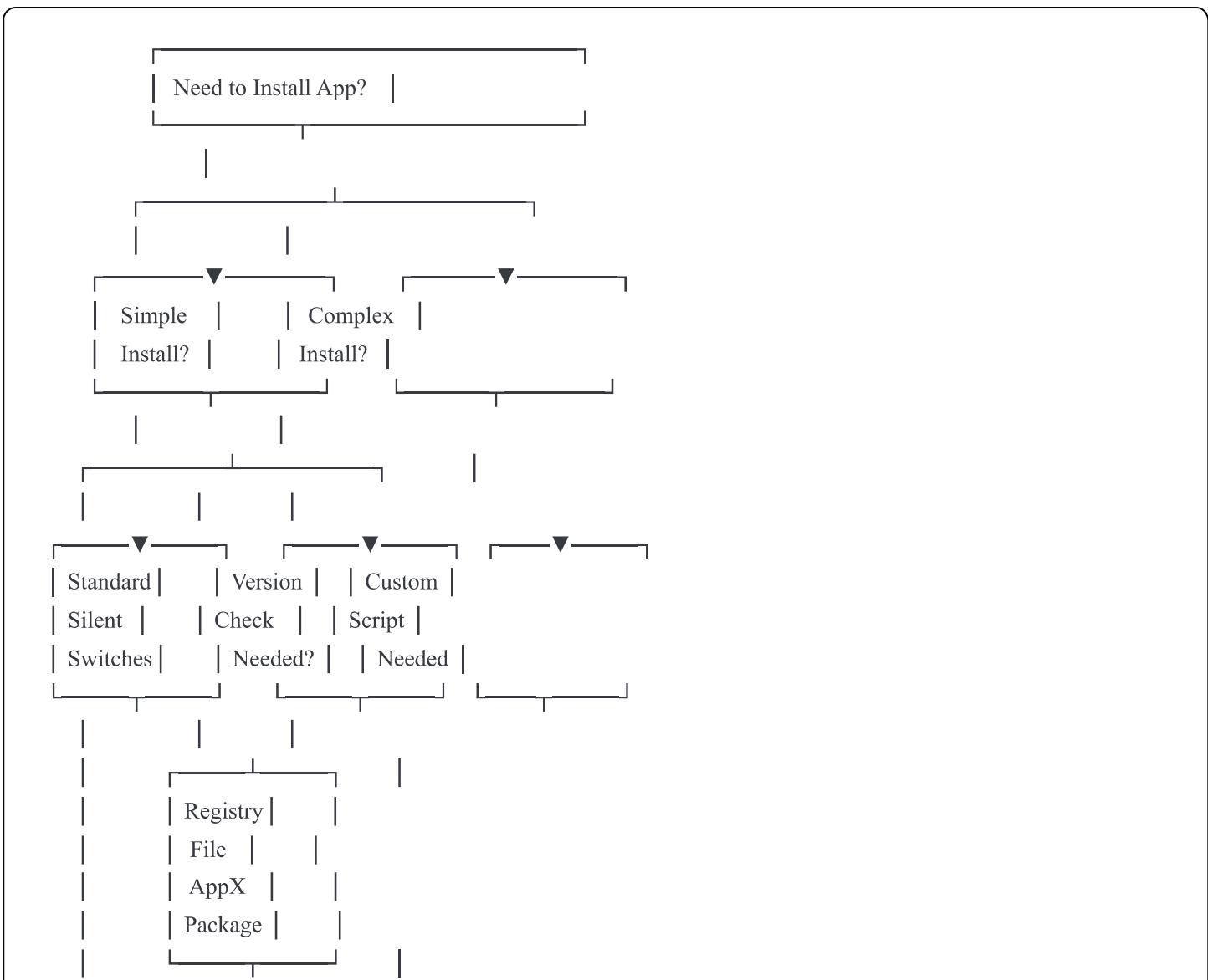
[Return to Orchestration]

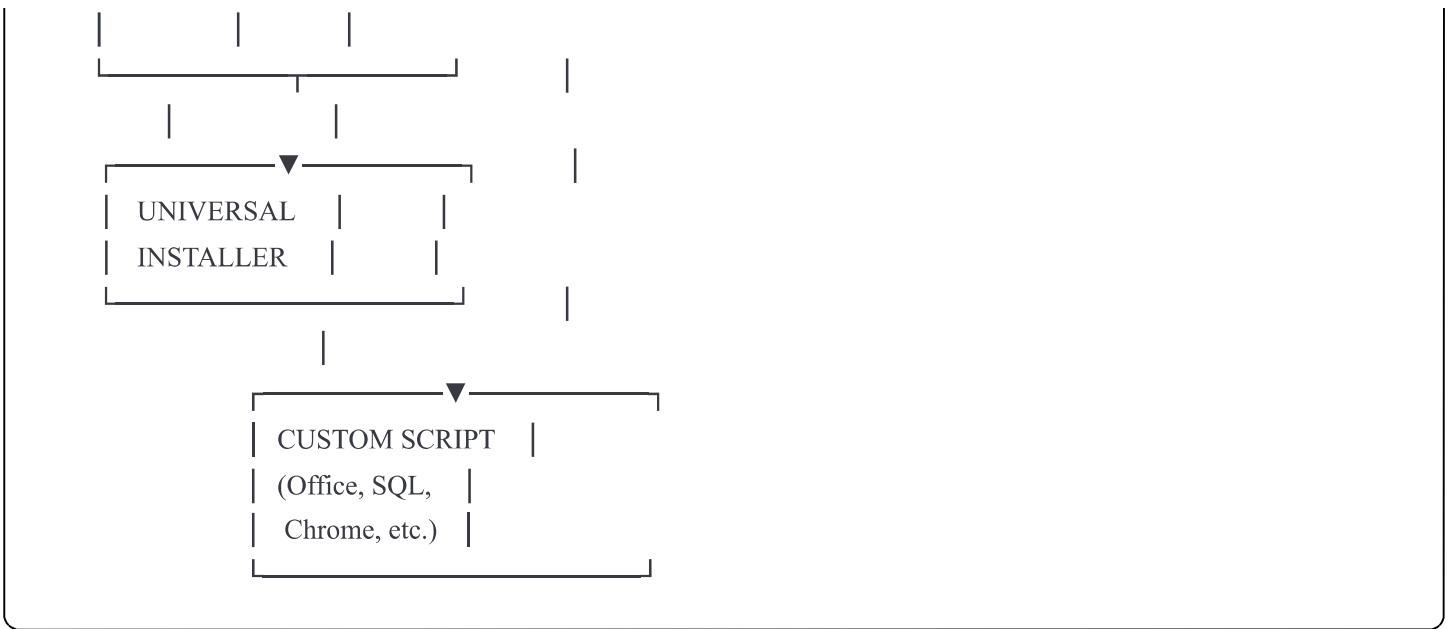
Exit Code: 0

Orchestration logs: "APP-010: Install 7-Zip - SUCCESS"

Continue to next task (APP-020)

## ☒ Decision Tree





## Summary: When to Use What

DECISION MATRIX	
Universal Installer	Custom Script
✓ Standard MSI/EXE	✓ Microsoft Office
✓ Silent install switches work	✓ SQL Server
✓ Simple file/registry detection	✓ Adobe Creative Cloud
✓ No complex pre/post config	✓ Enterprise browsers
✓ Standalone operation	✓ Complex policies
✓ 80% of apps	✓ Multi-step installs
	✓ 20% of apps
Examples:	Examples:
• 7-Zip	• MS Office 365
• Notepad++	• Chrome + policies
• VLC	• Firefox + policies
• Adobe Reader	• BitLocker config
• PuTTY	• SQL Server
• Git	• LOB applications

---

## Complete Deployment Timeline

Day 0: Preparation

- └─ Download application installers
- └─ Test silent install switches
- └─ Verify detection methods work

Day 1: Implementation

- └─ Copy Universal-AppInstaller.ps1 to Scripts\
- └─ Copy installers to Installers\Apps\
- └─ Update Orchestration-Config.ps1
- └─ Add first 5 applications

Day 2: Testing

- └─ Test installers manually
- └─ Test Universal Installer directly
- └─ Test with orchestration dry run
- └─ Test Phase 4 execution

Day 3: Expansion

- └─ Add remaining applications
- └─ Optimize detection methods
- └─ Fine-tune timeouts
- └─ Document special requirements

Day 4: Pilot

- └─ Deploy to pilot group (10 machines)
- └─ Monitor logs and results
- └─ Fix any issues discovered
- └─ Gather feedback

Day 5: Production Rollout

- └─ Deploy to Ring 1 (50 machines)
- └─ Monitor and validate
- └─ Deploy to Ring 2 (500 machines)
- └─ Monitor and validate
- └─ Deploy to remaining machines

Ongoing: Maintenance

- └─ Update installer versions
- └─ Add new applications

- └─ Review logs for issues
  - └─ Optimize as needed
- 

### This architecture provides:

- Clear separation of concerns
  - Modular design
  - Easy to maintain
  - Comprehensive logging
  - Reliable error handling
  - Scalable to 3000+ devices
- 

### End of Architecture Guide