YA logo of a cube

Description automatically generatedi’ Solutions

Microsoft Windows 10

不同的系统版本，有着不同的封装方式，封装过程中包含：“语言包：添加、关联、删除”、“驱动：添加、删除”、“累积更新：添加、删除”、“InBox Apps：添加、更新、标记”等。

在这背后藏着很多的隐藏故事，想解开这些，你准备好开始尝试封装了吗？

## 摘要

1. [部署映像](#_部署映像)
2. 目录
3. 部署映像 第 4 页
   * 1. 先决条件 第 4 页
4. ISO 工具 第 4 页
5. 要求 第 4 页
6. 系统安装包 第 4 页
7. 语言包 第 4 页
   1. 学习 第 4 页
   2. 语言包：下载 第 5 页
   3. 功能包：下载 第 5 页
8. InBox Apps 第 5 页
9. Windows 安全中心 第 5 页
10. 命令行 第 5 页
    * 1. 语言包：提取 第 6 页
11. 语言包：准备 第 6 页
12. 语言包：提取方案 第 6 页
13. 执行提取命令 第 6 页
    * 1. 自定义部署映像 第 12 页
14. 自定义部署映像：Install.wim 第 12 页
15. 查看 Install.wim 详细信息 第 12 页
16. 指定挂载 Install 路径 第 12 页
17. 开始挂载 Install.wim 第 12 页
    1. 自定义部署映像：WinRE.wim 第 13 页
       1. 查看 WinRE.wim 详细信息 第 13 页
       2. 指定挂载 WinRE.wim 路径 第 13 页
       3. 开始挂载 WinRE.wim 第 13 页
       4. 语言包 第 13 页
          1. 语言包：添加 第 13 页
          2. 组件：映像中已安装的所有包 第 15 页
       5. 保存映像 WinRE.wim 第 15 页
       6. 卸载映像 WinRE.wim 第 15 页
       7. 重建 WinRE.wim 后，可缩小文件大小 第 16 页
       8. 备份 WinRE.wim 第 16 页
       9. 替换 Install.wim 映像内的 WinRE.wim 第 17 页
18. 语言包 第 17 页
    1. 语言包：添加 第 17 页
    2. 组件：映像中已安装的所有包 第 23 页
19. InBox Apps 第 23 页
    1. InBox Apps：已安装 第 23 页
    2. 删除已安装的所有预应用程序 第 23 页
    3. 区域标记：添加方式 第 24 页
    4. InBox Apps：安装 第 25 页
    5. InBox Apps：优化 第 32 页
20. 累积更新 第 32 页
    1. 功能启用包 第 32 页
    2. 初始版本 第 32 页
    3. 其它版本 第 33 页
    4. 固化更新，可选项 第 34 页

* + 1. 固化更新后清理组件，可选项 第 34 页

1. 部署引擎：添加，可选 第 34 页
2. 健康 第 34 页
3. 替换 WinRE.wim 第 34 页
4. 保存映像 Install.wim 第 34 页
5. 卸载映像 Install.wim 第 34 页
6. 重建 Install.wim 后可缩小文件大小 第 35 页
7. 如何批量替换 Install.wim 里的所有索引号里的 WinRE.wim 第 35 页
   1. 获取 WimLib 第 35 页
   2. 如何在 Install.wim 里提取和更新 WinRE.wim 第 35 页
8. 自定义部署映像：boot.wim 第 37 页
9. 查看 Boot.wim 文件信息 第 37 页
10. 指定挂载 Boot.wim 路径 第 37 页
11. 开始挂载 Boot.wim 第 37 页
12. 语言包 第 37 页
    1. 语言包：添加 第 37 页
    2. 组件：映像中已安装的所有包 第 39 页
    3. 语言包：同步到 ISO 安装程序 第 39 页
    4. 重新生成 Lang.ini 第 39 页
       1. 重新生成已挂载目录 lang.ini 第 39 页
       2. 重新生成 lang.ini 后，同步到安装程序 第 39 页
13. 保存映像 Boot.wim 第 39 页
14. 卸载映像 Boot.wim 第 39 页
15. 部署引擎 第 40 页
16. 添加方式 第 40 页
17. 部署引擎：进阶 第 43 页
18. 生成 ISO 第 45 页

## 部署映像

### 先决条件

#### ISO 工具

准备一款可编辑 ISO 文件的软件，例如：PowerISO、DAEMON Tools、ISO Workshop；

#### 要求

##### 系统安装包

关键词：迭代、跨版本、大版本、累积更新、初始版本

* 1. 说明
     1. 每版本更新时请重新制作镜像，例如从 21H1 跨越到 22H2 时，应避免出现其它兼容性问题请勿在旧镜像基础上制作；
     2. 该条例已经在某些 OEM 厂商，通过各种形式向封装师明确传达了该法令，不允许直接从迭代版本里直接升级；
     3. 制作中请使用 “初始版本”、“开发者版”制作。微软官方文档里曾短暂的出现过在制作中必须使用初始版本，后来这句在官方文档里却被删除了；
     4. 安装语言包后，必须重新添加累积更新（可同一版本号），不添加累积更新会出现“乱码”、“界面闪退”等问题。
     5. 进化过程：Windows 10 22H2, Build 19045.2006 + KB5027215 = OS Build 19045.3086
  2. 准备下载初始版本或开发者版本
     1. [en-us\_windows\_10\_business\_editions\_version\_22h2\_x64\_dvd\_8cf17b79.iso](https://files.rg-adguard.net/file/b4901318-96a5-3755-c26d-c8cb5c816092)
     2. [en-us\_windows\_10\_consumer\_editions\_version\_22h2\_x64\_dvd\_8da72ab3.iso](https://files.rg-adguard.net/file/cbafa23b-cef5-6401-d0e2-da1533785c71)
  3. 示例下载 en-us\_windows\_10\_business\_editions\_version\_22h2\_x64\_dvd\_8cf17b79.iso 后，解压到：D:\en-us\_windows\_10\_business\_editions\_version\_22h2\_x64\_dvd\_8cf17b79
  4. 解压完成后，将目录en-us\_windows\_10\_business\_editions\_version\_22h2\_x64\_dvd\_8cf17b79 更改为 D:\OS\_10
  5. 所有脚本、所有路径，已默认设置为 D:\OS\_10 为映像来源。

##### 语言包

###### 学习

阅读时，请了解“蓝色”重要突出部分。

* + 1. [语言概述](https://learn.microsoft.com/zh-cn/windows-hardware/manufacture/desktop/languages-overview?view=windows-10)
    2. [将语言添加到 Windows 10 映像](https://learn.microsoft.com/en-us/azure/virtual-desktop/language-packs)
    3. [语言和区域按需功能 (FOD)](https://learn.microsoft.com/zh-cn/windows-hardware/manufacture/desktop/features-on-demand-language-fod?view=windows-11)

###### 语言包：下载

[https://software-download.microsoft.com/download/pr/19041.1.191206-1406.vb\_release\_CLIENTLANGPACKDVD\_OEM\_MULTI.iso](19041.1.191206-1406.vb_release_CLIENTLANGPACKDVD_OEM_MULTI.iso)

###### 功能包：下载

X64: <https://software-download.microsoft.com/download/pr/19041.1.191206-1406.vb_release_amd64fre_FOD-PACKAGES_OEM_PT1_amd64fre_MULTI.iso>

##### InBox Apps

<https://software-static.download.prss.microsoft.com/dbazure/888969d5-f34g-4e03-ac9d-1f9786c66749/19041.3031.230508-1728.vb_release_svc_prod3_amd64fre_InboxApps.iso>

#### Windows 安全中心

* 在处理封装任务时，将产生大量的临时文件，安装 InBox Apps 里的应用时会释放大量的安装文件；
* 开启 Windows 安全中心会扫描文件、会占用大量的 CPU。
* 测试中：未关闭前耗时 1 小时 22 分，关闭后耗时 20 分钟。

如何关闭：

绿色为命令行，按住 Windows 键并按 R 键启动“运行”。

1. 打开“Windows 安全中心”或运行：windowsdefender:
2. 选择“病毒和威胁防护”或运行：windowsdefender://threat
3. 找到“病毒和威胁防护设置”，点击“管理设置”或运行：windowsdefender://threatsettings，建议您关闭部分功能：
   1. 实时保护
   2. 云提供的保护
   3. 自动提交样本
   4. 篡改防护
4. 未处于封装时，建议您开启 Windows 安全中心。

#### 命令行

1. 可选“Terminal”或“PowerShell ISE”，未安装“Terminal”，请前往 <https://github.com/microsoft/terminal/releases> 后下载；
2. 以管理员身份打开“Terminal”或“PowerShell ISE”，设置 PowerShell 执行策略：绕过，PS 命令行：

Set-ExecutionPolicy -ExecutionPolicy Bypass -Force

1. 在本文中，绿色部分属于 PS 命令行，请复制后，粘贴到“Terminal”对话框，按回车键（Enter）后开始运行；
2. 有 .ps1 时，点击文件右键，选择以 PowerShell 运行，或复制路径，粘贴到“Terminal ”或“PowerShell ISE”里运行，带冒号的路径，在命令行添加 & 字符，示例：& "D:\Yi.Solutions\\_Encapsulation\\_SIP.ps1"

### 语言包：提取

#### 语言包：准备

1. 语言包：挂载

挂载 19041.1.191206-1406.vb\_release\_CLIENTLANGPACKDVD\_OEM\_MULTI.iso 或解压到任意位置；

1. 功能包：挂载

请正确选择架构版本，提取错误的语言包，安装会报错误。

X64: 19041.1.191206-1406.vb\_release\_amd64fre\_FOD-PACKAGES\_OEM\_PT1\_amd64fre\_MULTI.iso

#### 语言包：提取方案

##### 添加

* 1. 语言名称：简体中文 - 中国，区域：zh-CN，适用范围：Install.Wim，Boot.Wim，WinRE.Wim

##### 删除

* 1. 语言名称：英语 - 美国，区域：en-US，适用范围：Install.Wim，Boot.Wim，WinRE.Wim

##### 架构：x64

#### 执行提取命令

* Auto = 自动搜索本地所有磁盘，默认；
  + - * 自定义路径，例如指定为 E 盘：$ISO = "E:\"
      * Extract.ps1
        + [\Expand\Extract.ps1](Expand/Extract.ps1)
        + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Extract.ps1>
      * 复制代码

$ISO = "Auto"

$SaveTo = "D:\OS\_10\_Custom"

$Extract\_language\_Pack = @(

@{ Tag = "zh-CN"; Arch = "AMD64"; Act = "Add"; Scope = @("Install\Install"; "Install\WinRE"; "Boot\Boot") }

@{ Tag = "en-US"; Arch = "AMD64"; Act = "Del"; Scope = @( "Install\Install"; "Install\WinRE"; "Boot\Boot" ) }

)

Function Extract\_Language

{

param($NewArch, $Act, $NewLang, $Expand)

Function Match\_Required\_Fonts

{

param($Lang)

$Fonts = @(

@{ Match = @("as", "ar-SA", "ar", "ar-AE", "ar-BH", "ar-DJ", "ar-DZ", "ar-EG", "ar-ER", "ar-IL", "ar-IQ", "ar-JO", "ar-KM", "ar-KW", "ar-LB", "ar-LY", "ar-MA", "ar-MR", "ar-OM", "ar-PS", "ar-QA", "ar-SD", "ar-SO", "ar-SS", "ar-SY", "ar-TD", "ar-TN", "ar-YE", "arz-Arab", "ckb-Arab", "fa", "fa-AF", "fa-IR", "glk-Arab", "ha-Arab", "ks-Arab", "ks-Arab-IN", "ku-Arab", "ku-Arab-IQ", "mzn-Arab", "pa-Arab", "pa-Arab-PK", "pnb-Arab", "prs", "prs-AF", "prs-Arab", "ps", "ps-AF", "sd-Arab", "sd-Arab-PK", "tk-Arab", "ug", "ug-Arab", "ug-CN", "ur", "ur-IN", "ur-PK", "uz-Arab", "uz-Arab-AF"); Name = "Arab"; }

@{ Match = @("bn-IN", "as-IN", "bn", "bn-BD", "bpy-Beng"); Name = "Beng"; }

@{ Match = @("da-dk", "iu-Cans", "iu-Cans-CA"); Name = "Cans"; }

@{ Match = @("chr-Cher-US", "chr-Cher"); Name = "Cher"; }

@{ Match = @("hi-IN", "bh-Deva", "brx", "brx-Deva", "brx-IN", "hi", "ks-Deva", "mai", "mr", "mr-IN", "ne", "ne-IN", "ne-NP", "new-Deva", "pi-Deva", "sa", "sa-Deva", "sa-IN"); Name = "Deva"; }

@{ Match = @("am", "am-ET", "byn", "byn-ER", "byn-Ethi", "ti", "ti-ER", "ti-ET", "tig", "tig-ER", "tig-Ethi", "ve-Ethi", "wal", "wal-ET", "wal-Ethi"); Name = "Ethi"; }

@{ Match = @("gu", "gu-IN"); Name = "Gujr"; }

@{ Match = @("pa", "pa-IN", "pa-Guru"); Name = "Guru"; }

@{ Match = @("zh-CN", "cmn-Hans", "gan-Hans", "hak-Hans", "wuu-Hans", "yue-Hans", "zh-gan-Hans", "zh-hak-Hans", "zh-Hans", "zh-SG", "zh-wuu-Hans", "zh-yue-Hans"); Name = "Hans"; }

@{ Match = @("zh-TW", "cmn-Hant", "hak-Hant", "lzh-Hant", "zh-hak-Hant", "zh-Hant", "zh-HK", "zh-lzh-Hant", "zh-MO", "zh-yue-Hant"); Name = "Hant"; }

@{ Match = @("he", "he-IL", "yi"); Name = "Hebr"; }

@{ Match = @("ja", "ja-JP"); Name = "Jpan"; }

@{ Match = @("km", "km-KH"); Name = "Khmr"; }

@{ Match = @("kn", "kn-IN"); Name = "Knda"; }

@{ Match = @("ko", "ko-KR"); Name = "Kore"; }

@{ Match = @("de-de", "lo", "lo-LA"); Name = "Laoo"; }

@{ Match = @("ml", "ml-IN"); Name = "Mlym"; }

@{ Match = @("or", "or-IN"); Name = "Orya"; }

@{ Match = @("si", "si-LK"); Name = "Sinh"; }

@{ Match = @("tr-tr", "arc-Syrc", "syr", "syr-SY", "syr-Syrc"); Name = "Syrc"; }

@{ Match = @("ta", "ta-IN", "ta-LK", "ta-MY", "ta-SG"); Name = "Taml"; }

@{ Match = @("te", "te-IN"); Name = "Telu"; }

@{ Match = @("th", "th-TH"); Name = "Thai"; }

)

ForEach ($item in $Fonts) {

if (($item.Match) -Contains $Lang) {

return $item.Name

}

}

return "Not\_matched"

}

Function Match\_Other\_Region\_Specific\_Requirements

{

param($Lang)

$RegionSpecific = @(

@{ Match = @("zh-TW"); Name = "Taiwan"; }

)

ForEach ($item in $RegionSpecific) {

if (($item.Match) -Contains $Lang) {

return $item.Name

}

}

return "Skip\_specific\_packages"

}

Function Extract\_Process

{

param($Package, $Name, $NewSaveTo)

$NewSaveTo = "$($SaveTo)\$($NewSaveTo)\Language\$($Act)\$($NewLang)"

New-Item -Path $NewSaveTo -ItemType Directory -ErrorAction SilentlyContinue | Out-Null

if ($ISO -eq "Auto") {

Get-PSDrive -PSProvider FileSystem -ErrorAction SilentlyContinue | ForEach-Object {

ForEach ($item in $Package) {

$TempFilePath = Join-Path -Path $\_.Root -ChildPath $item -ErrorAction SilentlyContinue

if (Test-Path $TempFilePath -PathType Leaf) {

Write-host "`n Find: " -NoNewLine; Write-host $TempFilePath -ForegroundColor Green

Write-host " Copy to: " -NoNewLine; Write-host $NewSaveTo

Copy-Item -Path $TempFilePath -Destination $NewSaveTo -Force

}

}

}

} else {

ForEach ($item in $Package) {

$TempFilePath = Join-Path -Path $ISO -ChildPath $item -ErrorAction SilentlyContinue

Write-host "`n Find: " -NoNewline; Write-host $TempFilePath -ForegroundColor Green

if (Test-Path $TempFilePath -PathType Leaf) {

Write-host " Copy to: " -NoNewLine; Write-host $NewSaveTo

Copy-Item -Path $TempFilePath -Destination $NewSaveTo -Force

} else {

Write-host " Not found"

}

}

}

Write-host "`n Verify the language pack file"

ForEach ($item in $Package) {

$Path = "$($NewSaveTo)\$([IO.Path]::GetFileName($item))"

if (Test-Path $Path -PathType Leaf) {

Write-host " Discover: " -NoNewLine; Write-host $Path -ForegroundColor Green

} else {

Write-host " Not found: " -NoNewLine; Write-host $Path -ForegroundColor Red

}

}

}

$AdvLanguage = @(

@{

Path = "Install\Install"

Rule = @(

"Microsoft-Windows-LanguageFeatures-Fonts-{DiyLang}-Package~31bf3856ad364e35~AMD64~~.cab"

"{ARCHC}\langpacks\Microsoft-Windows-Client-Language-Pack\_x64\_{Lang}.cab"

"Microsoft-Windows-LanguageFeatures-Basic-{Lang}-Package~31bf3856ad364e35~AMD64~~.cab"

"Microsoft-Windows-LanguageFeatures-Handwriting-{Lang}-Package~31bf3856ad364e35~AMD64~~.cab"

"Microsoft-Windows-LanguageFeatures-OCR-{Lang}-Package~31bf3856ad364e35~AMD64~~.cab"

"Microsoft-Windows-LanguageFeatures-Speech-{Lang}-Package~31bf3856ad364e35~AMD64~~.cab"

"Microsoft-Windows-LanguageFeatures-TextToSpeech-{Lang}-Package~31bf3856ad364e35~AMD64~~.cab"

"Microsoft-Windows-InternetExplorer-Optional-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-MSPaint-FoD-Package~31bf3856ad364e35~wow64~{Lang}~.cab"

"Microsoft-Windows-MSPaint-FoD-Package~31bf3856ad364e35~{ARCH}~{Lang}~.cab"

"Microsoft-Windows-Notepad-FoD-Package~31bf3856ad364e35~{ARCH}~{Lang}~.cab"

"Microsoft-Windows-Notepad-FoD-Package~31bf3856ad364e35~wow64~{Lang}~.cab"

"Microsoft-Windows-PowerShell-ISE-FOD-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-PowerShell-ISE-FOD-Package~31bf3856ad364e35~wow64~{Lang}~.cab"

"Microsoft-Windows-Printing-PMCPPC-FoD-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-Printing-WFS-FoD-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-StepsRecorder-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-StepsRecorder-Package~31bf3856ad364e35~wow64~{Lang}~.cab"

"Microsoft-Windows-WordPad-FoD-Package~31bf3856ad364e35~AMD64~{Lang}~.cab"

"Microsoft-Windows-WordPad-FoD-Package~31bf3856ad364e35~wow64~{Lang}~.cab"

"Microsoft-Windows-InternationalFeatures-{Specific}-Package~31bf3856ad364e35~amd64~~.cab"

)

}

@{

Path = "Install\WinRE"

Rule = @(

"Windows Preinstallation Environment\x64\WinPE\_OCs\WinPE-FontSupport-{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\lp.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-securestartup\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-atbroker\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-audiocore\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-audiodrivers\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-enhancedstorage\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-narrator\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-scripting\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-speech-tts\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-srh\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-srt\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-wds-tools\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-wmi\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-appxpackaging\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-storagewmi\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-wifi\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-rejuv\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-opcservices\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-hta\_{Lang}.cab"

)

}

@{

Path = "Boot\Boot"

Rule = @(

"Windows Preinstallation Environment\x64\WinPE\_OCs\WinPE-FontSupport-{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\lp.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\WinPE-Setup\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\WINPE-SETUP-CLIENT\_{Lang}.CAB"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-securestartup\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-atbroker\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-audiocore\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-audiodrivers\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-enhancedstorage\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-narrator\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-scripting\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-speech-tts\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-srh\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-srt\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-wds-tools\_{Lang}.cab"

"Windows Preinstallation Environment\x64\WinPE\_OCs\{Lang}\winpe-wmi\_{Lang}.cab"

)

}

)

$NewFonts = Match\_Required\_Fonts -Lang $NewLang

$SpecificPackage = Match\_Other\_Region\_Specific\_Requirements -Lang $NewLang

$NewArchC = $NewArch.Replace("AMD64", "x64")

Foreach ($item in $Expand) {

$Language = @()

Foreach ($itemList in $AdvLanguage) {

if ($itemList.Path -eq $item) {

Foreach ($PrintLang in $itemList.Rule) {

$Language += "$($PrintLang)".Replace("{Lang}", $NewLang).Replace("{DiyLang}", $NewFonts).Replace("{Specific}", $SpecificPackage).Replace("{ARCH}", $NewArch).Replace("{ARCHC}", $NewArchC)

}

Extract\_Process -NewSaveTo $itemList.Path -Package $Language -Name $item

}

}

}

}

ForEach ($item in $Extract\_language\_Pack) { Extract\_Language -Act $item.Act -NewLang $item.Tag -NewArch $item.Arch -Expand $item.Scope }

### 自定义部署映像

#### 自定义部署映像：Install.wim

##### 查看 Install.wim 详细信息

映像名称、映像描述、映像大小、架构、版本、索引号等；

$ViewFile = "D:\OS\_10\Sources\Install.wim"

Get-WindowsImage -ImagePath $ViewFile | Foreach-Object { Get-WindowsImage -ImagePath $ViewFile -index $\_.ImageIndex }

循环操作区域，开始，

##### 指定挂载 Install 路径

New-Item -Path "D:\OS\_10\_Custom\Install\Install\Mount" -ItemType directory -ea SilentlyContinue

##### 开始挂载 Install.wim

默认索引号：1

Mount-WindowsImage -ImagePath "D:\OS\_10\sources\install.wim" -Index "1" -Path "D:\OS\_10\_Custom\Install\Install\Mount"

处理 Install.wim 映像内的文件，可选项，开始，

###### 自定义部署映像：WinRE.wim

注意：

* WinRE.wim 属于 Install.wim 映像内的文件；
* Install.wim 有多个索引号时，仅处理任意一个 WinRE.wim 即可；
* 同步至所有索引号即可减少 Install.wim 体积，学习“如何批量替换 Install.wim 里的所有索引号里的 WinRE.wim”。
  + 1. 查看 WinRE.wim 详细信息

映像名称、映像描述、映像大小、架构、版本、索引号等；

$ViewFile = "D:\OS\_10\_Custom\Install\Install\Mount\Windows\System32\Recovery\WinRE.wim"

Get-WindowsImage -ImagePath $ViewFile | Foreach-Object { Get-WindowsImage -ImagePath $ViewFile -index $\_.ImageIndex }

* + 1. 指定挂载 WinRE.wim 路径

New-Item -Path "D:\OS\_10\_Custom\Install\WinRE\Mount" -ItemType directory -ea SilentlyContinue

* + 1. 开始挂载 WinRE.wim

默认索引号：1

Mount-WindowsImage -ImagePath "D:\OS\_10\_Custom\Install\Install\Mount\Windows\System32\Recovery\WinRE.wim" -Index "1" -Path "D:\OS\_10\_Custom\Install\WinRE\Mount"

* + 1. 语言包
* 自动安装语言包：获取“组件：映像中已安装的所有包”后进行匹配，匹配到对应的名称后，再安装本地对应的语言包文件，查看报告“[语言安装包适用于 WinRE.wim](#_语言安装包适用于：WinRE.wim_1)”。
* 添加语言时，须对应不同的架构版本，未对应时，添加过程中报错等提示。
  + - 1. 语言包：添加
* WinRE.Instl.lang.ps1
  + [\Expand\Install\WinRE\WinRE.Instl.lang.ps1](Expand/Install/WinRE/WinRE.Instl.lang.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/WinRE/WinRE.Instl.lang.ps1>
* 复制代码

$Mount = "D:\OS\_10\_Custom\Install\WinRE\Mount"

$Sources = "D:\OS\_10\_Custom\Install\WinRE\Language\Add\zh-CN"

$Initl\_install\_Language\_Component = @()

Get-WindowsPackage -Path $Mount | ForEach-Object {

$Initl\_install\_Language\_Component += $\_.PackageName

}

Add-WindowsPackage -Path $Mount -PackagePath "$($Sources)\WinPE-FontSupport-zh-CN.cab"

$Language = @(

@{ Match = "\*WinPE-LanguagePack-Package\*"; File = "lp.cab"; }

@{ Match = "\*SecureStartup\*"; File = "winpe-securestartup\_zh-CN.cab"; }

@{ Match = "\*ATBroker\*"; File = "winpe-atbroker\_zh-CN.cab"; }

@{ Match = "\*AudioCore\*"; File = "winpe-audiocore\_zh-CN.cab"; }

@{ Match = "\*AudioDrivers\*"; File = "winpe-audiodrivers\_zh-CN.cab"; }

@{ Match = "\*EnhancedStorage\*"; File = "winpe-enhancedstorage\_zh-CN.cab"; }

@{ Match = "\*Narrator\*"; File = "winpe-narrator\_zh-CN.cab"; }

@{ Match = "\*scripting\*"; File = "winpe-scripting\_zh-CN.cab"; }

@{ Match = "\*Speech-TTS\*"; File = "winpe-speech-tts\_zh-CN.cab"; }

@{ Match = "\*srh\*"; File = "winpe-srh\_zh-CN.cab"; }

@{ Match = "\*srt\*"; File = "winpe-srt\_zh-CN.cab"; }

@{ Match = "\*wds-tools\*"; File = "winpe-wds-tools\_zh-CN.cab"; }

@{ Match = "\*-WMI-Package\*"; File = "winpe-wmi\_zh-CN.cab"; }

@{ Match = "\*WinPE-AppxPackaging\*"; File = "winpe-appxpackaging\_zh-CN.cab"; }

@{ Match = "\*StorageWMI\*"; File = "winpe-storagewmi\_zh-CN.cab"; }

@{ Match = "\*WiFi\*"; File = "winpe-wifi\_zh-CN.cab"; }

@{ Match = "\*rejuv\*"; File = "winpe-rejuv\_zh-CN.cab"; }

@{ Match = "\*opcservices\*"; File = "winpe-opcservices\_zh-CN.cab"; }

@{ Match = "\*hta\*"; File = "winpe-hta\_zh-CN.cab"; }

)

ForEach ($Rule in $Language) {

Write-host "`n Rule name: $($Rule.Match)" -ForegroundColor Yellow; Write-host " $('-' \* 80)"

ForEach ($Component in $Initl\_install\_Language\_Component) {

if ($Component -like "\*$($Rule.Match)\*") {

Write-host " Component name: " -NoNewline; Write-host $Component -ForegroundColor Green

Write-host " Language pack file: " -NoNewline; Write-host "$($Sources)\$($Rule.File)" -ForegroundColor Green

Write-Host " Installing ".PadRight(22) -NoNewline

try {

Add-WindowsPackage -Path $Mount -PackagePath "$($Sources)\$($Rule.File)" | Out-Null

Write-host "Finish" -ForegroundColor Green

} catch {

Write-host "Failed" -ForegroundColor Red

Write-host " $($\_)" -ForegroundColor Red

}

break

}

}

}

* + - 1. 组件：映像中已安装的所有包
         1. 查看

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Install\WinRE\Mount" | Out-GridView

* + - * 1. 导出到 Csv

$SaveTo = "D:\OS\_10\_Custom\Install\WinRE\Report.$(Get-Date -Format "yyyyMMddHHmmss").csv"

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Install\WinRE\Mount" | Export-CSV -NoType -Path $SaveTo

Write-host $SaveTo -ForegroundColor Green

* + 1. 保存映像 WinRE.wim

Save-WindowsImage -Path "D:\OS\_10\_Custom\Install\WinRE\Mount"

* + 1. 卸载映像 WinRE.wim

关闭所有可能正在访问映像中文件的应用程序，包括文件资源管理器。

Dismount-WindowsImage -Path "D:\OS\_10\_Custom\Install\WinRE\Mount" -Discard

* + 1. 重建 WinRE.wim 后，可缩小文件大小
* WinRE.Rebuild.ps1
  + [\Expand\Install\WinRE\WinRE.Rebuild.ps1](Expand/Install/WinRE/WinRE.Rebuild.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/WinRE/WinRE.Rebuild.ps1>
* 复制代码

$FileName = "D:\OS\_10\_Custom\Install\Install\Mount\Windows\System32\Recovery\WinRE.wim"

Get-WindowsImage -ImagePath $Filename -ErrorAction SilentlyContinue | ForEach-Object {

Write-Host " Image name: " -NoNewline

Write-Host $\_.ImageName -ForegroundColor Yellow

Write-Host " The index number: " -NoNewline

Write-Host $\_.ImageIndex -ForegroundColor Yellow

Write-Host "`n Rebuild".PadRight(28) -NoNewline

Export-WindowsImage -SourceImagePath $Filename -SourceIndex $\_.ImageIndex -DestinationImagePath "$($FileName).New" -CompressionType max

Write-Host "Finish`n" -ForegroundColor Green

}

if (Test-Path "$($FileName).New" -PathType Leaf) {

Remove-Item -Path $Filename

Move-Item -Path "$($FileName).New" -Destination $Filename

Write-Host "Finish" -ForegroundColor Green

} else {

Write-host "Failed" -ForegroundColor Red

}

* + 1. 备份 WinRE.wim
* WinRE.Backup.ps1
  + [\Expand\Install\WinRE\WinRE.Backup.ps1](Expand/Install/WinRE/WinRE.Backup.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/WinRE/WinRE.Backup.ps1>
* 复制代码

$WimLibPath = "D:\OS\_10\_Custom\Install\Install\Update\Winlib"

$FileName = "D:\OS\_10\_Custom\Install\Install\Mount\Windows\System32\Recovery\WinRE.wim"

New-Item -Path $WimLibPath -ItemType Directory -ea SilentlyContinue

Copy-Item -Path $FileName -Destination $WimLibPath -Force

* + 1. 替换 Install.wim 映像内的 WinRE.wim
* 每次挂载 Install.wim 后“[替换 WinRE.wim](#_替换_WinRE.wim)”；
* 学习“[获取 Install.wim 所有索引号后并替换旧的 WinRE.wim](#_获取_Install.wim_所有索引号后并替换旧的)”。

处理 Install.wim 映像内的文件，结束。

##### 语言包

* 自动安装语言包：获取“组件：映像中已安装的所有包”后进行匹配，匹配到对应的名称后，再安装本地对应的语言包文件，查看报告“[语言安装包适用于 Install.wim](#_语言安装包适用于：Install.wim)”。
* 添加语言时，须对应不同的架构版本，未对应时，添加过程中报错等提示。

###### 语言包：添加

* Install.Instl.lang.ps1
  + [\Expand\Install\Install.Instl.lang.ps1](Expand/Install/Install.Instl.lang.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.Instl.lang.ps1>
* 复制代码

Function Language\_Install

{

param($Mount, $Sources, $Lang)

$Initl\_install\_Language\_Component = @()

if (Test-Path $Mount -PathType Container) {

Get-WindowsPackage -Path $Mount | ForEach-Object { $Initl\_install\_Language\_Component += $\_.PackageName }

} else {

Write-Host "Not mounted: $($Mount)"

return

}

$Script:Init\_Folder\_All\_File = @()

if (Test-Path "$($Sources)\$($Lang)" -PathType Container) {

Get-ChildItem -Path $Sources -Recurse -Include "\*.cab" -ErrorAction SilentlyContinue | ForEach-Object {

$Script:Init\_Folder\_All\_File += $\_.FullName

}

Write-host "`n Available language pack installation files"

if ($Script:Init\_Folder\_All\_File.Count -gt 0) {

ForEach ($item in $Script:Init\_Folder\_All\_File) {

Write-host " $($item)"

}

} else {

Write-host "There are no language pack files locally"

return

}

} else {

Write-Host "Path does not exist: $($Sources)\$($Lang)"

return

}

$Script:Init\_Folder\_All\_File\_Match\_Done = @()

$Script:Init\_Folder\_All\_File\_Exclude = @()

$Script:Search\_File\_Order = @(

@{

Name = "Fonts"

Description = "Fonts"

Rule = @(

@{ Match\_Name = "\*Fonts\*"; IsMatch = "No"; Capability = ""; }

)

}

@{

Name = "Basic"

Description = "Basic"

Rule = @(

@{ Match\_Name = "\*LanguageFeatures-Basic\*"; IsMatch = "Yes"; Capability = "Language.Basic~~~$($Lang)~0.0.1.0"; }

@{ Match\_Name = "\*Client\*Language\*Pack\*"; IsMatch = "Yes"; Capability = "Language.Basic~~~$($Lang)~0.0.1.0"; }

)

}

@{

Name = "OCR"

Description = "Optical character recognition"

Rule = @(

@{ Match\_Name = "\*LanguageFeatures-OCR\*"; IsMatch = "Yes"; Capability = "Language.OCR~~~$($Lang)~0.0.1.0"; }

)

}

@{

Name = "Handwriting"

Description = "Handwriting recognition"

Rule = @(

@{ Match\_Name = "\*LanguageFeatures-Handwriting\*"; IsMatch = "Yes"; Capability = "Language.Handwriting~~~$($Lang)~0.0.1.0"; }

)

}

@{

Name = "TextToSpeech"

Description = "Text-to-speech"

Rule = @(

@{ Match\_Name = "\*LanguageFeatures-TextToSpeech\*"; IsMatch = "Yes"; Capability = "Language.TextToSpeech~~~$($Lang)~0.0.1.0"; }

)

}

@{

Name = "Speech"

Description = "Speech recognition"

Rule = @(

@{ Match\_Name = "\*LanguageFeatures-Speech\*"; IsMatch = "Yes"; Capability = "Language.Speech~~~$($Lang)~0.0.1.0"; }

)

}

@{

Name = "RegionSpecific"

Description = "Other region-specific requirements"

Rule = @(

@{ Match\_Name = "\*InternationalFeatures\*"; IsMatch = "No"; Capability = ""; }

)

}

@{

Name = "Retail"

Description = "Retail demo experience"

Rule = @(

@{ Match\_Name = "\*RetailDemo\*"; IsMatch = "Yes"; Capability = ""; }

)

}

@{

Name = "Features\_On\_Demand"

Description = "Features on demand"

Rule = @(

@{ Match\_Name = "\*InternetExplorer\*"; IsMatch = "Yes"; Capability = ""; }

@{ Match\_Name = "\*MSPaint\*amd64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.MSPaint~~~~0.0.1.0"; }

@{ Match\_Name = "\*MSPaint\*wow64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.MSPaint~~~~0.0.1.0"; }

@{ Match\_Name = "\*Notepad\*amd64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.Notepad~~~~0.0.1.0"; }

@{ Match\_Name = "\*Notepad\*wow64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.Notepad~~~~0.0.1.0"; }

@{ Match\_Name = "\*MediaPlayer\*amd64\*"; IsMatch = "Yes"; Capability = "Media.WindowsMediaPlayer~~~~0.0.12.0"; }

@{ Match\_Name = "\*MediaPlayer\*wow64\*"; IsMatch = "Yes"; Capability = "Media.WindowsMediaPlayer~~~~0.0.12.0"; }

@{ Match\_Name = "\*PowerShell-ISE-FOD-Package\*amd64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.PowerShell.ISE~~~~0.0.1.0"; }

@{ Match\_Name = "\*PowerShell-ISE-FOD-Package\*wow64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.PowerShell.ISE~~~~0.0.1.0"; }

@{ Match\_Name = "\*Printing\*PMCPPC\*amd64\*"; IsMatch = "Yes"; Capability = "Print.Management.Console~~~~0.0.1.0"; }

@{ Match\_Name = "\*Printing\*WFS\*amd64\*"; IsMatch = "Yes"; Capability = "Print.Management.Console~~~~0.0.1.0"; }

@{ Match\_Name = "\*StepsRecorder\*amd64\*"; IsMatch = "Yes"; Capability = "App.StepsRecorder~~~~0.0.1.0"; }

@{ Match\_Name = "\*StepsRecorder\*wow64\*"; IsMatch = "Yes"; Capability = "App.StepsRecorder~~~~0.0.1.0"; }

@{ Match\_Name = "\*WordPad\*amd64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.WordPad~~~~0.0.1.0"; }

@{ Match\_Name = "\*WordPad\*wow64\*"; IsMatch = "Yes"; Capability = "Microsoft.Windows.WordPad~~~~0.0.1.0"; }

@{ Match\_Name = "\*WMIC\*FoD\*Package\*amd64\*"; IsMatch = "Yes"; Capability = "WMIC~~~~"; }

@{ Match\_Name = "\*WMIC\*FoD\*Package\*wow64\*"; IsMatch = "Yes"; Capability = "WMIC~~~~"; }

)

}

)

ForEach ($item in $Script:Search\_File\_Order) { New-Variable -Name "Init\_File\_Type\_$($item.Name)" -Value @() -Force }

ForEach ($WildCard in $Script:Init\_Folder\_All\_File) {

ForEach ($item in $Script:Search\_File\_Order) {

ForEach ($NewRule in $item.Rule) {

if ($WildCard -like "\*$($NewRule.Match\_Name)\*") {

Write-host "`n Fuzzy matching: " -NoNewline; Write-host $NewRule.Match\_Name -ForegroundColor Green

Write-host " Language pack file: " -NoNewline; Write-host $WildCard -ForegroundColor Green

$OSDefaultUser = (Get-Variable -Name "Init\_File\_Type\_$($item.Name)" -ErrorAction SilentlyContinue).Value

$TempSave = @{ Match\_Name = $NewRule.Match\_Name; Capability = $NewRule.Capability; FileName = $WildCard }

$new = $OSDefaultUser + $TempSave

if ($NewRule.IsMatch -eq "Yes") {

ForEach ($Component in $Initl\_install\_Language\_Component) {

if ($Component -like "\*$($NewRule.Match\_Name)\*") {

Write-host " Component name: " -NoNewline; Write-host $Component -ForegroundColor Green

New-Variable -Name "Init\_File\_Type\_$($item.Name)" -Value $new -Force

$Script:Init\_Folder\_All\_File\_Match\_Done += $WildCard

break

}

}

} else {

Write-host " Do not match, install directly" -ForegroundColor Yellow

New-Variable -Name "Init\_File\_Type\_$($item.Name)" -Value $new -Force

$Script:Init\_Folder\_All\_File\_Match\_Done += $WildCard

}

}

}

}

}

Write-host "`n Grouping is complete, pending installation" -ForegroundColor Yellow

Write-host " $('-' \* 80)"

ForEach ($WildCard in $Script:Search\_File\_Order) {

$OSDefaultUser = (Get-Variable -Name "Init\_File\_Type\_$($WildCard.Name)" -ErrorAction SilentlyContinue).Value

Write-host "`n $($WildCard.Description) ( $($OSDefaultUser.Count) item )"

if ($OSDefaultUser.Count -gt 0) {

ForEach ($item in $OSDefaultUser) {

Write-host " $($item.FileName)" -ForegroundColor Green

}

} else {

Write-host " Not available" -ForegroundColor Red

}

}

Write-host "`n Not matched, no longer installed" -ForegroundColor Yellow

Write-host " $('-' \* 80)"

ForEach ($item in $Script:Init\_Folder\_All\_File) {

if ($Script:Init\_Folder\_All\_File\_Match\_Done -notcontains $item) {

$Script:Init\_Folder\_All\_File\_Exclude += $item

Write-host " $($item)" -ForegroundColor Red

}

}

Write-host "`n Install" -ForegroundColor Yellow

Write-host " $('-' \* 80)"

ForEach ($WildCard in $Script:Search\_File\_Order) {

$OSDefaultUser = (Get-Variable -Name "Init\_File\_Type\_$($WildCard.Name)" -ErrorAction SilentlyContinue).Value

Write-host "`n $($WildCard.Description) ( $($OSDefaultUser.Count) item )"; Write-host " $('-' \* 80)"

if ($OSDefaultUser.Count -gt 0) {

ForEach ($item in $OSDefaultUser) {

Write-host " Language pack file: " -NoNewline; Write-host $item.FileName -ForegroundColor Green

Write-Host " Installing ".PadRight(22) -NoNewline

if (Test-Path $item.FileName -PathType Leaf) {

try {

Add-WindowsPackage -Path $Mount -PackagePath $item.FileName | Out-Null

Write-host "Finish`n" -ForegroundColor Green

} catch {

Write-host "Failed" -ForegroundColor Red

Write-host " $($\_)" -ForegroundColor Red

}

} else {

Write-host "Does not exist`n"

}

}

} else {

Write-host " Not available`n" -ForegroundColor Red

}

}

}

Language\_Install -Mount "D:\OS\_10\_Custom\Install\Install\Mount" -Sources "D:\OS\_10\_Custom\Install\Install\Language\Add" -Lang "zh-CN"

###### 组件：映像中已安装的所有包

* + 1. 查看

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Out-GridView

* + 1. 导出到 Csv

$SaveTo = "D:\OS\_10\_Custom\Install\Install\Report.$(Get-Date -Format "yyyyMMddHHmmss").csv"

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Export-CSV -NoType -Path $SaveTo

Write-host $SaveTo -ForegroundColor Green

##### InBox Apps

###### InBox Apps：已安装

* + 1. 查看

Get-AppXProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Out-GridView

* + 1. 导出到 Csv

$SaveTo = "D:\OS\_10\_Custom\Install\Install\Report.$(Get-Date -Format "yyyyMMddHHmmss").csv"

Get-AppXProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Export-CSV -NoType -Path $SaveTo

Write-host $SaveTo -ForegroundColor Green

###### 删除已安装的所有预应用程序

* Install.InBox.Appx.Clear.all.ps1
  + [\Expand\Install\Install.InBox.Appx.Clear.all.ps1](Expand/Install/Install.InBox.Appx.Clear.all.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.InBox.Appx.Clear.all.ps1>
* 复制代码

Get-AppXProvisionedPackage -path "D:\OS\_10\_Custom\Install\Install\Mount" -ErrorAction SilentlyContinue | ForEach-Object {

Write-host "`n $($\_.DisplayName)"

Write-Host " Deleting ".PadRight(22) -NoNewline

try {

Remove-AppxProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -PackageName $\_.PackageName -ErrorAction SilentlyContinue | Out-Null

Write-host "Finish" -ForegroundColor Green

} catch {

Write-host "Failed" -ForegroundColor Red

}

}

###### 区域标记：添加方式

* + 1. 执行“语言包：添加”
    2. 安装“本地语言体验包（LXPs）”

微软官方向 Windows 10 提供了本地语言体验包（LXPS）安装文件，Windows 11 不再提供，想获取：

* + - 1. 使用“Windows 本地语言体验包（LXPs）下载器”下载

了解：<https://github.com/ilikeyi/LXPs>

下载后保存到：D:\OS\_10\_Custom\Install\Install\InBox.Appx，文件格式：LanguageExperiencePack.zh-CN.Neutral.Appx

* + - 1. 手动下载
         1. 区域

下载区域：zh-CN，应用程序 ID：9NRMNT6GMZ70，商店连接：https://www.microsoft.com/store/productId/9NRMNT6GMZ70

* + - * 1. 打开网站：<https://store.rg-adguard.net>

搜索关键词：

https://www.microsoft.com/store/productId/9NRMNT6GMZ70

网页内搜索 22621 内容，搜索结果：Microsoft.LanguageExperiencePackzh-CN\_22621.\*. neutral\_\_8wekyb3d8bbwe.appx

下载后保存到 D:\OS\_10\_Custom\Install\Install\InBox.Appx 目录里，重命名：LanguageExperiencePack.zh-cn.Neutral.Appx

* + - 1. 执行安装命令安装本地语言体验包（LXPs）

了解区域标记添加方式后，获得 LanguageExperiencePack.zh-cn.Neutral 后，执行安装命令：

Add-AppxProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -PackagePath "D:\OS\_10\_Custom\Install\Install\InBox.appx\LanguageExperiencePack.zh-cn.Neutral.appx" -SkipLicense

* + - 1. InBox Apps：已安装的应用程序包
         1. 查看

Get-AppXProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Out-GridView

* + - * 1. 导到出 Csv

$SaveTo = "D:\OS\_10\_Custom\Install\Install\Report.$(Get-Date -Format "yyyyMMddHHmmss").csv"

Get-AppXProvisionedPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" | Export-CSV -NoType -Path $SaveTo

Write-host $SaveTo -ForegroundColor Green

###### InBox Apps：安装

* + 1. 挂载或解压 InBox Apps 安装文件

挂载 19041.3031.230508-1728.vb\_release\_svc\_prod3\_amd64fre\_InboxApps.iso 或解压到任意位置；

* + 1. 执行安装命令后安装 InBox Apps 到：Install.wim
       - Auto = 自动搜索本地所有磁盘，默认；
       - 自定义路径，例如指定为 F 盘：$ISO = "F:\packages"
       - Install.Inst.InBox.Appx.ps1
       - [\Expand\Install\Install.Inst.InBox.Appx.ps1](Expand/Install/Install.Inst.InBox.Appx.ps1)
       - <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.Inst.InBox.Appx.ps1>
* 复制代码

$ISO = "Auto"

$Mount = "D:\OS\_10\_Custom\Install\Install\Mount"

try {

Write-host "`n Offline image version: " -NoNewline

$Current\_Edition\_Version = (Get-WindowsEdition -Path $Mount).Edition

Write-Host $Current\_Edition\_Version -ForegroundColor Green

} catch {

Write-Host "Error" -ForegroundColor Red

Write-Host " $($\_)" -ForegroundColor Yellow

return

}

$Pre\_Config\_Rules = @(

@{

Name = @("Core"; "CoreN"; "CoreSingleLanguage";)

Apps = @(

"Microsoft.UI.Xaml.2.3"; "Microsoft.UI.Xaml.2.4"; "Microsoft.UI.Xaml.2.7"; "Microsoft.NET.Native.Framework.2.2"; "Microsoft.NET.Native.Runtime.2.2"; "Microsoft.VCLibs.140.00"; "Microsoft.VCLibs.140.00.UWPDesktop"; "Microsoft.HEIFImageExtension"; "Microsoft.HEVCVideoExtension"; "Microsoft.SecHealthUI"; "Microsoft.VP9VideoExtensions"; "Microsoft.WebpImageExtension"; "Microsoft.WindowsStore"; "Microsoft.GamingApp"; "Microsoft.Sticky.Notes"; "Microsoft.Paint"; "Microsoft.PowerAutomateDesktop"; "Microsoft.ScreenSketch"; "Microsoft.WindowsNotepad"; "Microsoft.WindowsTerminal"; "Clipchamp.Clipchamp"; "Microsoft.Solitaire.Collection"; "Microsoft.WindowsAlarms"; "Microsoft.WindowsFeedbackHub"; "Microsoft.WindowsMaps"; "Microsoft.ZuneMusic"; "Microsoft.BingNews"; "Microsoft.DesktopAppInstaller"; "Microsoft.WindowsCamera"; "Microsoft.Getstarted"; "Microsoft.Cortana"; "Microsoft.BingWeather"; "Microsoft.GetHelp"; "Microsoft.MicrosoftOfficeHub"; "Microsoft.People"; "Microsoft.StorePurchaseApp"; "Microsoft.Todos"; "Microsoft.WebMediaExtensions"; "Microsoft.Windows.Photos"; "Microsoft.WindowsCalculator"; "Microsoft.Windows.CommunicationsApps"; "Microsoft.WindowsSoundRecorder"; "Microsoft.Xbox.TCUI"; "Microsoft.XboxGameOverlay"; "Microsoft.XboxGamingOverlay"; "Microsoft.XboxIdentityProvider"; "Microsoft.XboxSpeechToTextOverlay";

"Microsoft.YourPhone"; "Microsoft.ZuneVideo"; "MicrosoftCorporationII.QuickAssist"; "MicrosoftWindows.Client.WebExperience"; "Microsoft.RawImageExtension"; "MicrosoftCorporationII.MicrosoftFamily";

)

}

@{

Name = @("Education"; "Professional"; "ProfessionalEducation"; "ProfessionalWorkstation"; "Enterprise"; "IoTEnterprise"; "ServerRdsh";)

Apps = @(

"Microsoft.UI.Xaml.2.3"; "Microsoft.UI.Xaml.2.4"; "Microsoft.UI.Xaml.2.7"; "Microsoft.NET.Native.Framework.2.2"; "Microsoft.NET.Native.Runtime.2.2"; "Microsoft.VCLibs.140.00"; "Microsoft.VCLibs.140.00.UWPDesktop"; "Microsoft.HEIFImageExtension"; "Microsoft.HEVCVideoExtension"; "Microsoft.SecHealthUI"; "Microsoft.VP9VideoExtensions"; "Microsoft.WebpImageExtension"; "Microsoft.WindowsStore"; "Microsoft.GamingApp"; "Microsoft.Sticky.Notes"; "Microsoft.Paint"; "Microsoft.PowerAutomateDesktop"; "Microsoft.ScreenSketch"; "Microsoft.WindowsNotepad"; "Microsoft.WindowsTerminal"; "Clipchamp.Clipchamp"; "Microsoft.Solitaire.Collection"; "Microsoft.WindowsAlarms"; "Microsoft.WindowsFeedbackHub"; "Microsoft.WindowsMaps"; "Microsoft.ZuneMusic"; "Microsoft.BingNews"; "Microsoft.DesktopAppInstaller"; "Microsoft.WindowsCamera"; "Microsoft.Getstarted"; "Microsoft.Cortana"; "Microsoft.BingWeather"; "Microsoft.GetHelp"; "Microsoft.MicrosoftOfficeHub"; "Microsoft.People"; "Microsoft.StorePurchaseApp"; "Microsoft.Todos"; "Microsoft.WebMediaExtensions"; "Microsoft.Windows.Photos"; "Microsoft.WindowsCalculator"; "Microsoft.Windows.CommunicationsApps"; "Microsoft.WindowsSoundRecorder"; "Microsoft.Xbox.TCUI"; "Microsoft.XboxGameOverlay"; "Microsoft.XboxGamingOverlay"; "Microsoft.XboxIdentityProvider"; "Microsoft.XboxSpeechToTextOverlay"; "Microsoft.YourPhone"; "Microsoft.ZuneVideo"; "MicrosoftCorporationII.QuickAssist"; "MicrosoftWindows.Client.WebExperience"; "Microsoft.RawImageExtension";

)

}

@{

Name = @("EnterpriseN"; "EnterpriseGN"; "EnterpriseSN"; "ProfessionalN"; "EducationN"; "ProfessionalWorkstationN"; "ProfessionalEducationN"; "CloudN"; "CloudEN"; "CloudEditionN"; "CloudEditionLN"; "StarterN";)

Apps = @(

"Microsoft.UI.Xaml.2.3"; "Microsoft.UI.Xaml.2.4"; "Microsoft.UI.Xaml.2.7"; "Microsoft.NET.Native.Framework.2.2"; "Microsoft.NET.Native.Runtime.2.2"; "Microsoft.VCLibs.140.00"; "Microsoft.VCLibs.140.00.UWPDesktop"; "Microsoft.SecHealthUI"; "Microsoft.WindowsStore"; "Microsoft.Sticky.Notes"; "Microsoft.Paint"; "Microsoft.PowerAutomateDesktop"; "Microsoft.ScreenSketch"; "Microsoft.WindowsNotepad"; "Microsoft.WindowsTerminal"; "Clipchamp.Clipchamp"; "Microsoft.Solitaire.Collection"; "Microsoft.WindowsAlarms"; "Microsoft.WindowsFeedbackHub"; "Microsoft.WindowsMaps"; "Microsoft.BingNews"; "Microsoft.DesktopAppInstaller"; "Microsoft.WindowsCamera"; "Microsoft.Getstarted"; "Microsoft.Cortana"; "Microsoft.BingWeather"; "Microsoft.GetHelp"; "Microsoft.MicrosoftOfficeHub"; "Microsoft.People"; "Microsoft.StorePurchaseApp"; "Microsoft.Todos"; "Microsoft.Windows.Photos"; "Microsoft.WindowsCalculator"; "Microsoft.Windows.CommunicationsApps"; "Microsoft.XboxGameOverlay"; "Microsoft.XboxIdentityProvider"; "Microsoft.XboxSpeechToTextOverlay"; "Microsoft.YourPhone"; "MicrosoftCorporationII.QuickAssist"; "MicrosoftWindows.Client.WebExperience";

)

}

)

$Allow\_Install\_App = @()

ForEach ($item in $Pre\_Config\_Rules) {

if ($item.Name -contains $Current\_Edition\_Version) {

Write-host "`n Match to: "-NoNewline

Write-host $Current\_Edition\_Version -ForegroundColor Green

$Allow\_Install\_App = $item.Apps

break

}

}

Write-host "`n The app to install ( $($Allow\_Install\_App.Count) item )" -ForegroundColor Yellow

Write-host " $('-' \* 80)"

ForEach ($item in $Allow\_Install\_App) {

Write-host " $($item)" -ForegroundColor Green

}

$InBoxApps = @(

@{ Name = "Microsoft.UI.Xaml.2.3"; File = "Microsoft.UI.Xaml.x64.2.3.appx"; License = ""; }

@{ Name = "Microsoft.UI.Xaml.2.4"; File = "Microsoft.UI.Xaml.x64.2.4.appx"; License = ""; }

@{ Name = "Microsoft.UI.Xaml.2.7"; File = "Microsoft.UI.Xaml.x64.2.7.appx"; License = ""; }

@{ Name = "Microsoft.NET.Native.Framework.2.2"; File = "Microsoft.NET.Native.Framework.x64.2.2.appx"; License = ""; }

@{ Name = "Microsoft.NET.Native.Runtime.2.2"; File = "Microsoft.NET.Native.Runtime.x64.2.2.appx"; License = ""; }

@{ Name = "Microsoft.VCLibs.140.00"; File = "Microsoft.VCLibs.x64.14.00.appx"; License = ""; }

@{ Name = "Microsoft.VCLibs.140.00.UWPDesktop"; File = "Microsoft.VCLibs.x64.14.00.UWPDesktop.appx"; License = ""; }

@{ Name = "Microsoft.WindowsStore"; File = "Microsoft.WindowsStore\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsStore\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.HEIFImageExtension"; File = "Microsoft.HEIFImageExtension\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.HEIFImageExtension\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.HEVCVideoExtension"; File = "Microsoft.HEVCVideoExtension\_8wekyb3d8bbwe.x64.appx"; License = "Microsoft.HEVCVideoExtension\_8wekyb3d8bbwe.x64.xml"; }

@{ Name = "Microsoft.SecHealthUI"; File = "Microsoft.SecHealthUI\_8wekyb3d8bbwe.x64.appx"; License = "Microsoft.SecHealthUI\_8wekyb3d8bbwe.x64.xml"; }

@{ Name = "Microsoft.VP9VideoExtensions"; File = "Microsoft.VP9VideoExtensions\_8wekyb3d8bbwe.x64.appx"; License = "Microsoft.VP9VideoExtensions\_8wekyb3d8bbwe.x64.xml"; }

@{ Name = "Microsoft.WebpImageExtension"; File = "Microsoft.WebpImageExtension\_8wekyb3d8bbwe.x64.appx"; License = "Microsoft.WebpImageExtension\_8wekyb3d8bbwe.x64.xml"; }

@{ Name = "Microsoft.GamingApp"; File = "Microsoft.GamingApp\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.GamingApp\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Sticky.Notes"; File = "Microsoft.MicrosoftStickyNotes\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.MicrosoftStickyNotes\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Paint"; File = "Microsoft.Paint\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.Paint\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.PowerAutomateDesktop"; File = "Microsoft.PowerAutomateDesktop\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.PowerAutomateDesktop\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.ScreenSketch"; File = "Microsoft.ScreenSketch\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.ScreenSketch\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsNotepad"; File = "Microsoft.WindowsNotepad\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsNotepad\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsTerminal"; File = "Microsoft.WindowsTerminal\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsTerminal\_8wekyb3d8bbwe.xml"; }

@{ Name = "Clipchamp.Clipchamp"; File = "Clipchamp.Clipchamp\_yxz26nhyzhsrt.msixbundle"; License = "Clipchamp.Clipchamp\_yxz26nhyzhsrt.xml"; }

@{ Name = "Microsoft.Solitaire.Collection"; File = "Microsoft.MicrosoftSolitaireCollection\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.MicrosoftSolitaireCollection\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsAlarms"; File = "Microsoft.WindowsAlarms\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsAlarms\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsFeedbackHub"; File = "Microsoft.WindowsFeedbackHub\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsFeedbackHub\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsMaps"; File = "Microsoft.WindowsMaps\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsMaps\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.ZuneMusic"; File = "Microsoft.ZuneMusic\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.ZuneMusic\_8wekyb3d8bbwe.xml"; }

@{ Name = "MicrosoftCorporationII.MicrosoftFamily"; File = "MicrosoftCorporationII.MicrosoftFamily\_8wekyb3d8bbwe.msixbundle"; License = "MicrosoftCorporationII.MicrosoftFamily\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.BingNews"; File = "Microsoft.BingNews\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.BingNews\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.DesktopAppInstaller"; File = "Microsoft.DesktopAppInstaller\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.DesktopAppInstaller\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsCamera"; File = "Microsoft.WindowsCamera\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.WindowsCamera\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Getstarted"; File = "Microsoft.Getstarted\_8wekyb3d8bbwe.msixbundle"; License = "Microsoft.Getstarted\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Cortana"; File = "Microsoft.CortanaApp\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.CortanaApp\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.BingWeather"; File = "Microsoft.BingWeather\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.BingWeather\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.GetHelp"; File = "Microsoft.GetHelp\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.GetHelp\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.MicrosoftOfficeHub"; File = "Microsoft.MicrosoftOfficeHub\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.MicrosoftOfficeHub\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.People"; File = "Microsoft.People\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.People\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.StorePurchaseApp"; File = "Microsoft.StorePurchaseApp\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.StorePurchaseApp\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Todos"; File = "Microsoft.Todos\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.Todos\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WebMediaExtensions"; File = "Microsoft.WebMediaExtensions\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.WebMediaExtensions\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Windows.Photos"; File = "Microsoft.Windows.Photos\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.Windows.Photos\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsCalculator"; File = "Microsoft.WindowsCalculator\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.WindowsCalculator\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Windows.CommunicationsApps"; File = "Microsoft.WindowsCommunicationsApps\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.WindowsCommunicationsApps\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.WindowsSoundRecorder"; File = "Microsoft.WindowsSoundRecorder\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.WindowsSoundRecorder\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.Xbox.TCUI"; File = "Microsoft.Xbox.TCUI\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.Xbox.TCUI\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.XboxGameOverlay"; File = "Microsoft.XboxGameOverlay\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.XboxGameOverlay\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.XboxGamingOverlay"; File = "Microsoft.XboxGamingOverlay\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.XboxGamingOverlay\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.XboxIdentityProvider"; File = "Microsoft.XboxIdentityProvider\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.XboxIdentityProvider\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.XboxSpeechToTextOverlay"; File = "Microsoft.XboxSpeechToTextOverlay\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.XboxSpeechToTextOverlay\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.YourPhone"; File = "Microsoft.YourPhone\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.YourPhone\_8wekyb3d8bbwe.xml"; }

@{ Name = "Microsoft.ZuneVideo"; File = "Microsoft.ZuneVideo\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.ZuneVideo\_8wekyb3d8bbwe.xml"; }

@{ Name = "MicrosoftCorporationII.QuickAssist"; File = "MicrosoftCorporationII.QuickAssist\_8wekyb3d8bbwe.appxbundle"; License = "MicrosoftCorporationII.QuickAssist\_8wekyb3d8bbwe.xml"; }

@{ Name = "MicrosoftWindows.Client.WebExperience"; File = "MicrosoftWindows.Client.WebExperience\_cw5n1h2txyewy.appxbundle"; License = "MicrosoftWindows.Client.WebExperience\_cw5n1h2txyewy.xml"; }

@{ Name = "Microsoft.RawImageExtension"; File = "Microsoft.RawImageExtension\_8wekyb3d8bbwe.appxbundle"; License = "Microsoft.RawImageExtension\_8wekyb3d8bbwe.xml"; }

)

Function Install\_Appx

{

param($File, $License)

Write-host " $('-' \* 80)"

Write-host " Installing: " -NoNewline; Write-host $File -ForegroundColor Yellow

if (Test-Path -Path $File -PathType Leaf) {

if (Test-Path -Path $License -PathType Leaf) {

Write-host " License: " -NoNewline; Write-host $License -ForegroundColor Yellow

Write-host " With License".PadRight(22) -NoNewline -ForegroundColor Green

Write-host " Installing".PadRight(22) -NoNewline

try {

Add-AppxProvisionedPackage -Path $Mount -PackagePath $File -LicensePath $License -ErrorAction SilentlyContinue | Out-Null

Write-Host "Done" -ForegroundColor Green

} catch {

Write-Host "Failed" -ForegroundColor Red

Write-Host " $($\_)" -ForegroundColor Yellow

}

} else {

Write-host " No License".PadRight(22) -NoNewline -ForegroundColor Red

Write-host " Installing".PadRight(22) -NoNewline

try {

Add-AppxProvisionedPackage -Path $Mount -PackagePath $File -SkipLicense -ErrorAction SilentlyContinue | Out-Null

Write-Host "Done" -ForegroundColor Green

} catch {

Write-Host "Failed" -ForegroundColor Red

Write-Host " $($\_)" -ForegroundColor Yellow

}

}

} else {

Write-host " The installation package does not exist" -ForegroundColor Red

}

}

ForEach ($Rule in $InBoxApps) {

Write-host "`n Name: " -NoNewline

Write-host $Rule.Name -ForegroundColor Yellow

Write-host " $('-' \* 80)"

if($Allow\_Install\_App -contains $Rule.Name) {

Write-host " Search for apps: " -NoNewline

Write-host $Rule.File -ForegroundColor Yellow

Write-host " Search for License: " -NoNewline

Write-host $Rule.File -ForegroundColor Yellow

if ($ISO -eq "Auto") {

Get-PSDrive -PSProvider FileSystem -ErrorAction SilentlyContinue | ForEach-Object {

$AppPath = Join-Path -Path $\_.Root -ChildPath "packages\$($Rule.File)" -ErrorAction SilentlyContinue

$LicensePath = Join-Path -Path $\_.Root -ChildPath "packages\$($Rule.License)" -ErrorAction SilentlyContinue

if (Test-Path $AppPath -PathType Leaf) {

Write-host " $('-' \* 80)"

Write-host " Discover apps: " -NoNewLine; Write-host $AppPath -ForegroundColor Green

if (Test-Path $LicensePath -PathType Leaf) {; Write-host " Discover License: " -NoNewLine

Write-host $LicensePath -ForegroundColor Green

} else {

Write-host " License: " -NoNewLine

Write-host "Not found" -ForegroundColor Red

}

Install\_Appx -File $AppPath -License $LicensePath

return

}

}

} else {

Install\_Appx -File "$($ISO)\$($Rule.File)" -License "$($ISO)\$($Rule.License)"

}

} else {

Write-host " Skip the installation" -ForegroundColor Red

}

}

###### InBox Apps：优化

在安装应用后，应优化预配 Appx 包，通过用硬链接替换相同的文件来减少应用的磁盘使用量，仅针对脱机映像。

Dism /Image:"D:\OS\_10\_Custom\Install\Install\Mount" /Optimize-ProvisionedAppxPackages

##### 累积更新

* 不同版本、旧版本升级到最新版时，需优先添加“功能启用包”后才能添加最新版累积更新；
* 添加语言包后，可安装与初始版本相同的累积更新，以解决安装后未刷新“组件：映像中已安装的所有包”状态的已知问题；
* 为保持最新，推荐您下载最新版。

###### 功能启用包

* 学习：[KB5015684：使用启用包对 Windows 10 版本 22H2 的特别推荐更新](https://aka.ms/ekb-22H2)
* 注意：使用 Windows 10 22H2 19045.2006 相同版本和以上版本号时，可跳过功能启用包。
* 制作 Windows 10 版本 2004、20H2、21H1、21H2 时，需提前安装“功能启用包”后才能安装 19045.\* 的累积更新，下载后保存到：D:\OS\_10\_Custom\Install\Install\Update，根据架构选择下载：
  + 1. x64，默认
* 直连下载

<https://catalog.s.download.windowsupdate.com/c/upgr/2022/07/windows10.0-kb5015684-x64_523c039b86ca98f2d818c4e6706e2cc94b634c4a.msu>

* 安装

$KBPath = "D:\OS\_10\_Custom\Install\Install\Update\windows10.0-kb5015684-x64\_523c039b86ca98f2d818c4e6706e2cc94b634c4a.msu"

Add-WindowsPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -PackagePath $KBPath

###### 初始版本

累积更新 KB5017308 已无法从 <https://www.catalog.update.microsoft.com/Search.aspx?q=KB5017308> 里搜索到，通过直连方式下载后保存到：D:\OS\_10\_Custom\Install\Install\Update，根据架构选择下载：

* + 1. x64，默认
* 直连下载

<https://catalog.s.download.windowsupdate.com/c/msdownload/update/software/secu/2022/09/windows10.0-kb5017308-x64_2027053968a06948b45d139d95475ab4feee5654.msu>

* 安装

$KBPath = "D:\OS\_10\_Custom\Install\Install\Update\windows10.0-kb5017308-x64\_2027053968a06948b45d139d95475ab4feee5654.msu"

Add-WindowsPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -PackagePath $KBPath

###### 其它版本

查阅“[Windows 10 版本信息](https://learn.microsoft.com/zh-cn/windows/release-health/release-information)”，例如下载累积更新：KB5032278，前往下载页面：<https://www.catalog.update.microsoft.com/Search.aspx?q=KB5032278>，下载后保存到：D:\OS\_10\_Custom\Install\Install\Update，或通过直连下载，根据架构选择下载：

* + 1. x64，默认
* 直连下载

<https://catalog.s.download.windowsupdate.com/d/msdownload/update/software/updt/2023/11/windows10.0-kb5032278-x64_3a2b384f690eaa92c5030c535ac4a7e47c71a635.msu>

* 添加

$KBPath = "D:\OS\_10\_Custom\Install\Install\Update\windows10.0-kb5032278-x64\_3a2b384f690eaa92c5030c535ac4a7e47c71a635.msu"

Add-WindowsPackage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -PackagePath $KBPath

###### 固化更新，可选项

固化后不可卸载，固化时将清理恢复映像并重置任何被取代的组件的基础。

Dism /Image:"D:\OS\_10\_Custom\Install\Install\Mount" /cleanup-image /StartComponentCleanup /ResetBase

* + 1. 固化更新后清理组件，可选项

$Mount = "D:\OS\_10\_Custom\Install\Install\Mount"

Get-WindowsPackage -Path $Mount -ErrorAction SilentlyContinue | ForEach-Object {

if ($\_.PackageState -eq "Superseded") {

Write-Host " $($\_.PackageName)" -ForegroundColor Green

Remove-WindowsPackage -Path $Mount -PackageName $\_.PackageName | Out-Null

}

}

##### 部署引擎：添加，可选

* 了解“[部署引擎](#_部署引擎)”，如果添加到 ISO 安装介质，可跳过添加到已挂载；
* 如果添加部署引擎到已挂载里，请继续在当前位置执行下一步。

##### 健康

保存前应检查是否损坏，健康状态异常时，中止保存

Repair-WindowsImage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -ScanHealth

##### 替换 WinRE.wim

已批量替换 Install.wim 里的所有索引号里的 WinRE.wim 请跳过该步骤。

$WinRE = "D:\OS\_10\_Custom\Install\Install\Update\Winlib\WinRE.wim"

$CopyTo = "D:\OS\_10\_Custom\Install\Install\Mount\Windows\System32\Recovery"

Copy-Item -Path $WinRE -Destination $CopyTo -Force

##### 保存映像 Install.wim

Save-WindowsImage -Path "D:\OS\_10\_Custom\Install\Install\Mount"

##### 卸载映像 Install.wim

关闭所有可能正在访问映像中文件的应用程序，包括文件资源管理器。

Dismount-WindowsImage -Path "D:\OS\_10\_Custom\Install\Install\Mount" -Discard

循环操作区域，结束。

##### 重建 Install.wim 后可缩小文件大小

* Install.Rebuild.wim.ps1
  + [\Expand\Install\Install.Rebuild.wim.ps1](Expand/Install/Install.Rebuild.wim.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.Rebuild.wim.ps1>
* 复制代码

$InstallWim = "D:\OS\_10\sources\install.wim"

Get-WindowsImage -ImagePath $InstallWim -ErrorAction SilentlyContinue | ForEach-Object {

Write-Host " Image name: " -NoNewline

Write-Host $\_.ImageName -ForegroundColor Yellow

Write-Host " The index number: " -NoNewline

Write-Host $\_.ImageIndex -ForegroundColor Yellow

Write-Host "`n Under reconstruction".PadRight(28) -NoNewline

Export-WindowsImage -SourceImagePath $InstallWim -SourceIndex $\_.ImageIndex -DestinationImagePath "$($InstallWim).New" -CompressionType max | Out-Null

Write-Host "Finish`n" -ForegroundColor Green

}

if (Test-Path "$($InstallWim).New" -PathType Leaf) {

Remove-Item -Path $InstallWim

Move-Item -Path "$($InstallWim).New" -Destination $InstallWim

Write-Host "Finish" -ForegroundColor Green

} else {

Write-host "Failed" -ForegroundColor Red

}

##### [如何批量替换 Install.wim 里的所有索引号里的 WinRE.wim](#_3.1__)

###### 获取 WimLib

前往 <https://wimlib.net> 官方网站后，选择不同的版本：[arm64](https://wimlib.net/downloads/wimlib-1.14.3-windows-aarch64-bin.zip), [x64](https://wimlib.net/downloads/wimlib-1.14.3-windows-aarch64-bin.zip), [x86](https://wimlib.net/downloads/wimlib-1.14.3-windows-i686-bin.zip)，下载完成后解压到：D:\Wimlib

###### 如何在 Install.wim 里提取和更新 WinRE.wim

* + 1. 从 Install.wim 里提取 WinRE.wim 文件Install.wim
* Install.WinRE.Replace.wim.ps1
  + [\Expand\Install\Install.WinRE.Replace.wim.ps1](Expand/Install/Install.WinRE.Replace.wim.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.WinRE.Replace.wim.ps1>
* 复制代码

$Arguments = @(

"extract",

"D:\OS\_10\sources\install.wim", "1",

"\Windows\System32\Recovery\Winre.wim",

"--dest-dir=""D:\OS\_10\_Custom\Install\Install\Update\Winlib"""

)

New-Item -Path "D:\OS\_10\_Custom\Install\Install\Update\Winlib" -ItemType Directory -ea SilentlyContinue

Start-Process -FilePath "d:\wimlib\wimlib-imagex.exe" -ArgumentList $Arguments -wait -nonewwindow

* + 1. 获取 Install.wim 所有索引号后并替换旧的 WinRE.wim
* Install.WinRE.Replace.wim.ps1
  + [\Expand\Install\Install.WinRE.Replace.wim.ps1](Expand/Install/Install.WinRE.Replace.wim.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Install/Install.WinRE.Replace.wim.ps1>
* 复制代码

Get-WindowsImage -ImagePath "D:\OS\_10\sources\install.wim" -ErrorAction SilentlyContinue | ForEach-Object {

Write-Host " Image name: " -NoNewline; Write-Host $\_.ImageName -ForegroundColor Yellow

Write-Host " The index number: " -NoNewline; Write-Host $\_.ImageIndex -ForegroundColor Yellow

Write-Host "`n Replacement "

$Arguments = @(

"update",

"D:\OS\_10\sources\install.wim", $\_.ImageIndex,

"--command=""add 'D:\OS\_10\_Custom\Install\Install\Update\Winlib\WinRE.wim' '\Windows\System32\Recovery\WinRe.wim'"""

)

Start-Process -FilePath "d:\wimlib\wimlib-imagex.exe" -ArgumentList $Arguments -wait -nonewwindow

Write-Host " Finish`n" -ForegroundColor Green

}

#### 自定义部署映像：boot.wim

##### 查看 Boot.wim 文件信息

映像名称、映像描述、映像大小、架构、版本、索引号等；

$ViewFile = "D:\OS\_10\Sources\Boot.wim"

Get-WindowsImage -ImagePath $ViewFile | Foreach-Object { Get-WindowsImage -ImagePath $ViewFile -index $\_.ImageIndex }

##### 指定挂载 Boot.wim 路径

New-Item -Path "D:\OS\_10\_Custom\Boot\Boot\Mount" -ItemType directory -ea SilentlyContinue

##### 开始挂载 Boot.wim

默认索引号：2

Mount-WindowsImage -ImagePath "D:\OS\_10\sources\boot.wim" -Index "2" -Path "D:\OS\_10\_Custom\Boot\Boot\Mount"

##### 语言包

* 自动安装语言包：获取“组件：映像中已安装的所有包”后进行匹配，匹配到对应的名称后，再安装本地对应的语言包文件，查看报告“[语言安装包适用于 Boot.wim](#_语言安装包适用于：Boot.wim_1)”。
* 添加语言时，须对应不同的架构版本，未对应时，添加过程中报错等提示。

###### 语言包：添加

* Boot.Instl.lang.ps1
  + [\Expand\Boot\Boot.Instl.lang.ps1](Expand/Boot/Boot.Instl.lang.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/Boot/Boot.Instl.lang.ps1>
* 复制代码

$Mount = "D:\OS\_10\_Custom\Boot\Boot\Mount"

$Sources = "D:\OS\_10\_Custom\Boot\Boot\Language\Add\zh-CN"

$Initl\_install\_Language\_Component = @()

Get-WindowsPackage -Path $Mount | ForEach-Object {

$Initl\_install\_Language\_Component += $\_.PackageName

}

Add-WindowsPackage -Path $Mount -PackagePath "$($Sources)\WinPE-FontSupport-zh-CN.cab"

$Language = @(

@{ Match = "\*WinPE\*Setup\*Client\*Package\*"; File = "WINPE-SETUP-CLIENT\_zh-CN.CAB"; }

@{ Match = "\*WinPE\*Setup\*Package\*"; File = "WinPE-Setup\_zh-CN.cab"; }

@{ Match = "\*WinPE-LanguagePack-Package\*"; File = "lp.cab"; }

@{ Match = "\*SecureStartup\*"; File = "winpe-securestartup\_zh-CN.cab"; }

@{ Match = "\*ATBroker\*"; File = "winpe-atbroker\_zh-CN.cab"; }

@{ Match = "\*AudioCore\*"; File = "winpe-audiocore\_zh-CN.cab"; }

@{ Match = "\*AudioDrivers\*"; File = "winpe-audiodrivers\_zh-CN.cab"; }

@{ Match = "\*EnhancedStorage\*"; File = "winpe-enhancedstorage\_zh-CN.cab"; }

@{ Match = "\*Narrator\*"; File = "winpe-narrator\_zh-CN.cab"; }

@{ Match = "\*scripting\*"; File = "winpe-scripting\_zh-CN.cab"; }

@{ Match = "\*Speech-TTS\*"; File = "winpe-speech-tts\_zh-CN.cab"; }

@{ Match = "\*srh\*"; File = "winpe-srh\_zh-CN.cab"; }

@{ Match = "\*srt\*"; File = "winpe-srt\_zh-CN.cab"; }

@{ Match = "\*wds-tools\*"; File = "winpe-wds-tools\_zh-CN.cab"; }

@{ Match = "\*-WMI-Package\*"; File = "winpe-wmi\_zh-CN.cab"; }

)

ForEach ($Rule in $Language) {

Write-host "`n Rule name: $($Rule.Match)" -ForegroundColor Yellow; Write-host " $('-' \* 80)"

ForEach ($Component in $Initl\_install\_Language\_Component) {

if ($Component -like "\*$($Rule.Match)\*") {

Write-host " Component name: " -NoNewline; Write-host $Component -ForegroundColor Green

Write-host " Language pack file: " -NoNewline; Write-host "$($Sources)\$($Rule.File)" -ForegroundColor Green

Write-Host " Installing ".PadRight(22) -NoNewline

try {

Add-WindowsPackage -Path $Mount -PackagePath "$($Sources)\$($Rule.File)" | Out-Null

Write-host "Finish" -ForegroundColor Green

} catch {

Write-host "Failed" -ForegroundColor Red

Write-host " $($\_)" -ForegroundColor Red

}

break

}

}

}

###### 组件：映像中已安装的所有包

* + 1. 查看

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Boot\Boot\Mount" | Out-GridView

* + 1. 导出到 Csv

$SaveTo = "D:\OS\_10\_Custom\Boot\Boot\Report.$(Get-Date -Format "yyyyMMddHHmmss").csv"

Get-WindowsPackage -Path "D:\OS\_10\_Custom\Boot\Boot\Mount" | Export-CSV -NoType -Path $SaveTo

Write-host $SaveTo -ForegroundColor Green

###### 语言包：同步到 ISO 安装程序

Copy-Item -Path "D:\OS\_10\_Custom\Boot\Boot\Mount\sources\zh-CN" -Destination "D:\OS\_10\sources\zh-CN" -Recurse -Force

###### 重新生成 Lang.ini

重新生成后，可调整“安装界面”，选择“语言”时的顺序，打开 lang.ini，默认首选值 = 3，非默认值 = 2。

* + 1. 重新生成已挂载目录 lang.ini

重新生成的Lang.ini 文件位置：D:\en-us\_windows\_server\_2022\_x64\_dvd\_620d7eac\_Custom\Boot\Boot\Mount\Sources\lang.ini

Dism /image:"D:\OS\_10\_Custom\Boot\Boot\Mount" /gen-langini /distribution:"D:\OS\_10\_Custom\Boot\Boot\Mount"

* + 1. 重新生成 lang.ini 后，同步到安装程序

重新生成的Lang.ini 文件位置：D:\en-us\_windows\_server\_2022\_x64\_dvd\_620d7eac\Sources\lang.ini

Dism /image:"D:\OS\_10\_Custom\Boot\Boot\Mount" /gen-langini /distribution:"D:\OS\_10"

##### 保存映像 Boot.wim

Save-WindowsImage -Path "D:\OS\_10\_Custom\Boot\Boot\Mount"

##### 卸载映像 Boot.wim

关闭所有可能正在访问映像中文件的应用程序，包括文件资源管理器。

Dismount-WindowsImage -Path "D:\OS\_10\_Custom\Boot\Boot\Mount" -Discard

#### 部署引擎

* + - * 了解“自动添加 Windows 系统已安装的语言”，学习：<https://github.com/ilikeyi/Multilingual>，如何下载：
      * 进入网站后，点击 “代码”，“下载压缩包”，下载完成后得到 main.zip 压缩包文件。
      * 前往 <https://github.com/ilikeyi/Multilingual/releases> 下载页面，选择可用版本：1.1.1.1，选择下载源代码格式：zip，下载完成后得到 Multilingual-1.1.1.1.zip 压缩包文件；
      * 将已下载的 main.zip 或 Multilingual-1.1.1.1.zip，解压到：D:\Multilingual-1.1.1.1，重命名：D:\Multilingual
      * 学习“[无人值守 Windows 安装参考](https://learn.microsoft.com/en-us/windows-hardware/customize/desktop/unattend/)”，通过无人值守来干预安装过程。

##### 添加方式

###### 添加到 ISO 安装介质

* + 1. 无人值守
       1. 添加到：[ISO]:\Autounattend.xml

引导 ISO 安装时，Autounattend.xml 干预 WinPE 安装程序。

复制 D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml 到 D:\OS\_10\Autounattend.xml

Copy-Item "D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml" -Destination "D:\OS\_10\Autounattend.xml" -Force

* + - 1. 添加到：[ISO]:\Sources\Unattend.xml

挂载或解压 ISO 时，运行 [ISO]:\Setup.exe 安装程序后，[ISO]:\Sources\Unattend.xml 将干预安装过程。

复制 D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml 到 D:\OS\_10\Sources\Unattend.xml

Copy-Item "D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml" -Destination "D:\OS\_10\Sources\Unattend.xml" -Force

* + - 1. 添加到：[ISO]:\sources\$OEM$\$$\Panther\unattend.xml

安装过程中复制到系统盘里，复制到：{系统盘}:\Windows\Panther\unattend.xml

* + - * 1. 创建 $OEM$ 路径

New-Item -Path "D:\OS\_10\sources\`$OEM$\`$$\Panther" -ItemType Directory

* + - * 1. 复制

复制 D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml 到 D:\OS\_10\Sources\$OEM$\Panther\Unattend.xml

Copy-Item "D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml" -Destination "D:\OS\_10\sources\`$OEM$\`$$\Panther\Unattend.xml" -Force

* + 1. 部署引擎：添加

添加“自动添加 Windows 系统已安装的语言”到 D:\OS\_10\sources\$OEM$\$1\Yi\Engine 目录里。

* + - 1. 部署引擎：复制

复制 D:\Multilingual\Engine 到 D:\OS\_10\Sources\$OEM$\$1\Yi\Engine

Copy-Item "D:\Multilingual\Engine" -Destination "D:\OS\_10\sources\`$OEM$\`$1\Yi\Engine" -Recurse -Force

* + - 1. 部署引擎：自定义部署标记

$Flag = @(

"Is\_Mark\_Sync" # 允许全盘搜索并同步部署标记

# 先决部署

# "Auto\_Update" # 允许自动更新

# "Use\_UTF8" # Beta 版：使用 Unicode UTF-8 提供全球语言支持

"Disable\_Network\_Location\_Wizard" # 网络位置向导

"Disable\_Cleanup\_Appx\_Tasks" # Appx 清理维护任务

"Disable\_Cleanup\_On\_Demand\_Language" # 阻止清理未使用的按需功能语言包

"Disable\_Cleanup\_Unsed\_Language" # 阻止清理未使用的语言包

"Prerequisites\_Reboot" # 重新启动计算机

# 完成首次部署

# "Popup\_Engine" # 允许首次弹出部署引擎主界面

# "Allow\_First\_Pre\_Experience" # 允许首次预体验，按计划

"Reset\_Execution\_Policy" # 恢复 PowerShell 执行策略：受限

"Clear\_Solutions" # 删除整个解决方案

"Clear\_Engine" # 删除部署引擎，保留其它

# "First\_Experience\_Reboot" # 重新启动计算机

)

ForEach ($item in $Flag) {

Write-host " $($item)" -ForegroundColor Green

New-Item -Path "D:\OS\_10\sources\`$OEM$\`$1\Yi\Engine\Deploy\Allow" -ItemType Directory -ErrorAction SilentlyContinue | Out-Null

Out-File -FilePath "D:\OS\_10\sources\`$OEM$\`$1\Yi\Engine\Deploy\Allow\$($item)" -Encoding utf8 -ErrorAction SilentlyContinue

}

###### 添加到已挂载

通过“自定义部署映像：Install.wim”，执行“开始挂载 Install.wim”，挂载到：D:\OS\_10\_Custom\Install\Install\Mount

* + 1. 无人值守

复制 D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml 到 D:\OS\_10\_Custom\Install\Install\Mount\Panther\Unattend.xml

Copy-Item "D:\Multilingual\\_Learn\Unattend\Mul.Unattend.xml" -Destination "D:\OS\_10\_Custom\Install\Install\Mount\Panther" -Force

* + 1. 部署引擎

添加“自动添加 Windows 系统已安装的语言”到 D:\OS\_10\_Custom\Install\Install\Mount\Yi\Engine 目录里。

* + - 1. 部署引擎：复制

复制 D:\Multilingual\Engine 到 D:\OS\_10\_Custom\Install\Install\Mount\Yi\Engine

Copy-Item "D:\Multilingual\Engine" -Destination "D:\OS\_10\_Custom\Install\Install\Mount\Yi\Engine" -Recurse -Force

* + - 1. 部署引擎：自定义部署标记

$Flag = @(

"Is\_Mark\_Sync" # 允许全盘搜索并同步部署标记

# 先决部署

# "Auto\_Update" # 允许自动更新

# "Use\_UTF8" # Beta 版：使用 Unicode UTF-8 提供全球语言支持

"Disable\_Network\_Location\_Wizard" # 网络位置向导

"Disable\_Cleanup\_Appx\_Tasks" # Appx 清理维护任务

"Disable\_Cleanup\_On\_Demand\_Language" # 阻止清理未使用的按需功能语言包

"Disable\_Cleanup\_Unsed\_Language" # 阻止清理未使用的语言包

"Prerequisites\_Reboot" # 重新启动计算机

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# "Popup\_Engine" # 允许首次弹出部署引擎主界面

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"Reset\_Execution\_Policy" # 恢复 PowerShell 执行策略：受限

"Clear\_Solutions" # 删除整个解决方案

"Clear\_Engine" # 删除部署引擎，保留其它

# "First\_Experience\_Reboot" # 重新启动计算机

)

ForEach ($item in $Flag) {

Write-host " $($item)" -ForegroundColor Green

New-Item -Path "D:\OS\_10\_Custom\Install\Install\Mount\Yi\Engine\Deploy\Allow" -ItemType Directory -ErrorAction SilentlyContinue | Out-Null

Out-File -FilePath "D:\OS\_10\_Custom\Install\Install\Mount\Yi\Engine\Deploy\Allow\$($item)" -Encoding utf8 -ErrorAction SilentlyContinue

}

##### 部署引擎：进阶

###### 部署引擎：添加过程中

在复制部署引擎后，可添加部署标记来干预安装过程。

###### 无人值守方案

自定义无人值守时，以下文件存在时请同步修改：

* D:\OS\_10\Autounattend.xml
* D:\OS\_10\Sources\Unattend.xml
* D:\OS\_10\sources\$OEM$\$$\Panther\unattend.xml
* D:\OS\_10\_Custom\Install\Install\Mount\Panther\Unattend.xml
  + 1. 多语言或单语

多语言时，单语时，可互相切换，替换时，请替换文件里所有相同的。

* + - 1. 多语言

<UILanguage>%OSDUILanguage%</UILanguage>

<InputLocale>%OSDInputLocale%</InputLocale>

<SystemLocale>%OSDSystemLocale%</SystemLocale>

<UILanguage>%OSDUILanguage%</UILanguage>

<UILanguageFallback>%OSDUILanguageFallback%</UILanguageFallback>

<UserLocale>%OSDUserLocale%</UserLocale>

* + - 1. 单语

单语需指定区域，例如指定区域：zh-CN

<UILanguage>zh-CN</UILanguage>

<InputLocale>zh-CN</InputLocale>

<SystemLocale>zh-CN</SystemLocale>

<UILanguage>zh-CN</UILanguage>

<UILanguageFallback>zh-CN</UILanguageFallback>

<UserLocale>zh-CN</UserLocale>

* + 1. 用户方案

默认使用自建用户Administrator 并自动登录，可通过修改以下配置切换：自建、自定义用户。

* + - 1. 自建用户 Administrator

默认使用自建用户：Administrator 并自动登录，插入到 <OOBE> 和 </OOBE> 之间。

<UserAccounts>

<LocalAccounts>

<LocalAccount wcm:action="add">

<Password>

<Value></Value>

<PlainText>true</PlainText>

</Password>

<Description>Administrator</Description>

<DisplayName>Administrator</DisplayName>

<Group>Administrators</Group>

<Name>Administrator</Name>

</LocalAccount>

</LocalAccounts>

</UserAccounts>

<AutoLogon>

<Password>

<Value></Value>

<PlainText>true</PlainText>

</Password>

<Enabled>true</Enabled>

<Username>Administrator</Username>

</AutoLogon>

* + - 1. 自定义用户

设置自定义用户后，安装系统完成后，在 OOBE 里，可选择本地、在线用户等设置。

* + - * 1. 删除

用户名：从开始处删除 <UserAccounts> 到 </UserAccounts>

自动登录：从开始处删除 <AutoLogon> 到 </AutoLogon>

* + - * 1. 替换

从开始处 <OOBE> 到 </OOBE>

<OOBE>

<ProtectYourPC>3</ProtectYourPC>

<HideEULAPage>true</HideEULAPage>

<HideWirelessSetupInOOBE>true</HideWirelessSetupInOOBE>

</OOBE>

### 生成 ISO

#### 下载 OScdimg

根据架构选择 Oscdimg 版本，下载后保存到：D:\ ，保存在其它路径请输入 OScdimg.exe 绝对路径；

* 1. x64

<https://github.com/ilikeyi/solutions/raw/main/_Software/Oscdimg/amd64/oscdimg.exe>

* 1. x86

<https://github.com/ilikeyi/solutions/raw/main/_Software/Oscdimg/x86/oscdimg.exe>

* 1. arm64

<https://github.com/ilikeyi/solutions/raw/main/_Software/Oscdimg/arm64/oscdimg.exe>

#### 使用 oscdimg命令行生成一个 ISO 文件，保存到：D:\Win11.iso

* ISO.ps1
  + [\Expand\ISO.ps1](Expand/ISO.ps1)
  + <https://github.com/ilikeyi/solutions/blob/main/_Learn/Packaging.tutorial/OS.10/22H2/Expand/ISO.ps1>
* 复制代码

$Oscdimg = "D:\Oscdimg.exe"

$ISO = "D:\OS\_10"

$Volume = "OS\_10"

$SaveTo = "D:\OS\_10.iso"

$Arguments = @("-m", "-o", "-u2", "-udfver102", "-l""$($Volume)""", "-bootdata:2#p0,e,b""$($ISO)\boot\etfsboot.com""#pEF,e,b""$($ISO)\efi\microsoft\boot\efisys.bin""", $ISO, $SaveTo)

Start-Process -FilePath $Oscdimg -ArgumentList $Arguments -wait -nonewwindow

YA logo of a cube

Description automatically generatedi’ Solutions

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建议或反馈：<https://github.com/ilikeyi/solutions/issues>