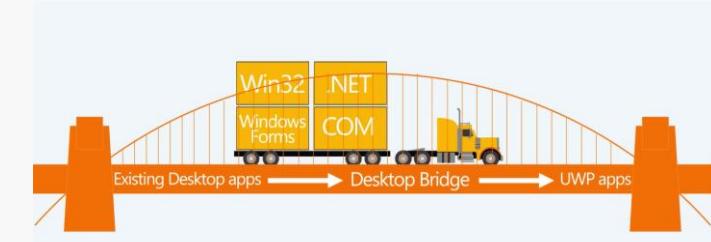




Desktop Bridge: Hands-on Training

Microsoft Japan Co., Ltd.
Developer Experience & Evangelism

Agenda



- Prerequisites & Hands-On-Lab (HOL) Setup
- **Exercise 1:** Converting using the Desktop App Converter (DAC)
- **Exercise 2:** Signing the new Appx
- **Exercise 3:** Installing the converted Appx
- **Exercise 4:** Creating PRI resources (optional)
- **Exercise 5:** Setting up the development environment
- **Exercise 6:** Creating Appx package using SDK tools
- **Exercise 7:** Creating Appx Package using Visual Studio

Overall Objective

The objective of this HOL manual is to demonstrate ways in using the DesktopAppConverter (DAC) & related tools/SDKs for converting regular installation into Appx installer

Flow

Convert

Test

Create Appx

Install & Test

Prerequisites & HOL Setup

Prerequisite Software

Supported OS:

Windows 10 Version 1607 Professional or Enterprise

Desktop App Converter:

<http://aka.ms/converter>

Windows SDK:

<https://developer.microsoft.com/windows/downloads/windows-10-sdk>

Base Image:

<http://aka.ms/converterimages>

Prerequisite Hardware

Required hardware virtualize mechanism (Second Level Address Translation)

Confirm it by using Coreinfo utility:

<http://technet.microsoft.com/en-us/sysinternals/cc835722>

```
C:¥Sysinternals>coreinfo -v
Coreinfo v3.4 - Dump information on system CPU and
.....
HYPERVISOR * Hypervisor is present
VMX      - Supports Intel hardware-assisted
virtualization
EPT      - Supports Intel extended page tables (SLAT)
```

Install Base Image

```
C:¥> DesktopAppConverter.exe -Setup -BaseImage  
BaseImage-14393.wim
```

Please note:

- Must use same build image of host OS
 - -Setup option is required only once

Sample Installer for Exercise:

VLC Media Player: Download from <https://www.videolan.org/vlc/>



The screenshot shows the official website for VideoLAN. At the top, there's a navigation bar with links for "VideoLAN ORGANIZATION", "VideoLAN", "VLC", "Projects", "Contribute", "Support", and two donation buttons for 4.00 and 5.00. Below the navigation, a banner states "VideoLAN, a project and a non-profit organisation." A large image of the VLC media player interface is displayed, showing a scene from the movie Iron Man. To the right of the player, the text "VLC media player" is written in a large, gold-colored font. Below this, a paragraph describes VLC as a free and open source cross-platform multimedia player and framework. At the bottom right, there's a prominent orange button labeled "Download VLC" with a dropdown arrow, and below it, text indicating the version is 2.2.4 for Windows, 28 MB in size, and has 150,792,495 downloads.

VideoLAN, a project and a [non-profit organisation](#).

VLC media player

VLC is a free and open source cross-platform multimedia player and framework that plays most multimedia files as well as DVDs, Audio CDs, VCDs, and various streaming protocols.

[Download VLC](#) ▾

Version 2.2.4 • Windows • 28 MB
150,792,495 downloads so far

Folder structure

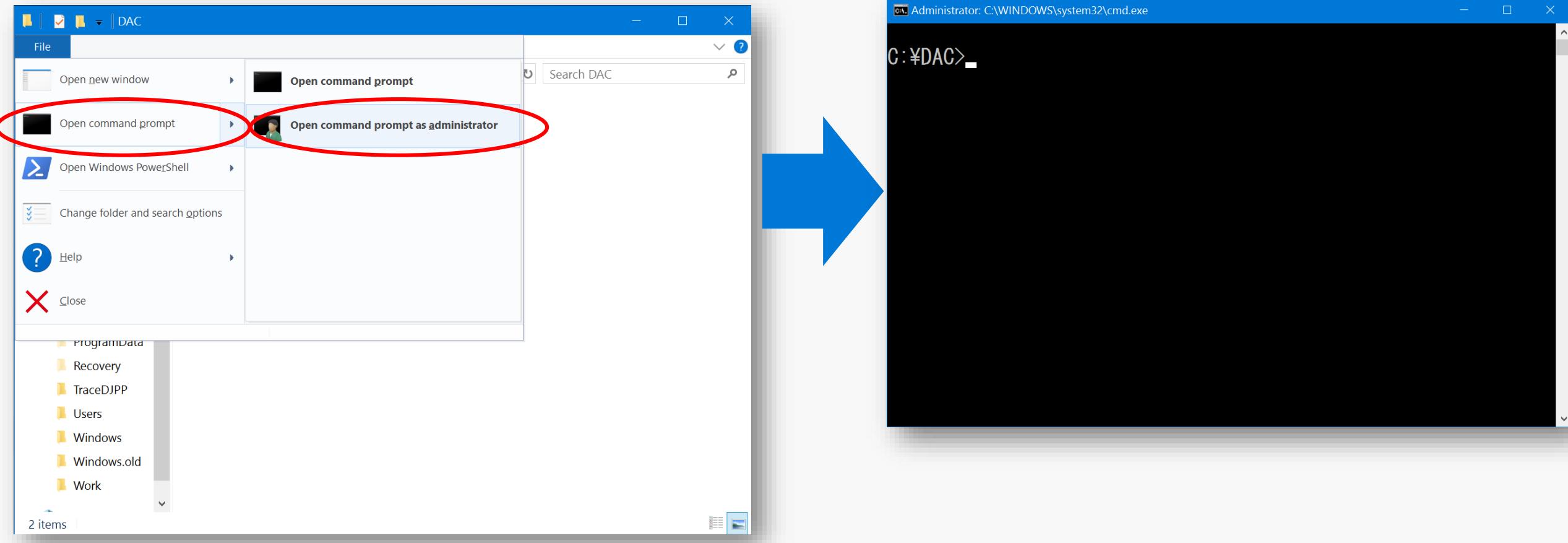
Folder structure will be assumed as shown below:

C:¥DAC ————— Command operation purpose
└ ¥Input —— vlc-2.2.2-win32.exe

HowTo 1: Converting using the Desktop App Converter (DAC)

Step 1: Open command prompt

Open command prompt with admin right then set current folder to C:¥DAC



Step 2: Use below command-line options:

```
C:\$DAC> DesktopAppConverter.exe -Installer  
".\$input\$vlc-2.2.4-win32.exe" -InstallerArguments  
"/S /L=1033" -Destination "." -PackageName "VLC" -  
Publisher "CN=videoLAN" -Version 2.2.4.0 -MakeAppx  
-Verbose
```

Installer	Installer (EXE/MSI/Etc)
InstallerArguments	Silent install parameters (eg /quiet, /silent, /s, /q)
Destination	Output folder
PackageName	Package Name and file name of Appx
Publisher	Must be in CN=xxxxx format (Organization of certificate)
Version	Major . Minor . Build . Revision format
MakeAppx	DAC v 1.0.6 or above recommended

After conversion has successfully completed:

Output Paths:

Name	Value
-----	-----
CertPath	
PackageFilesPath	.¥VLC¥PackageFiles
PackagePath	.¥VLC¥VLC.appx
LogFilePath	.¥VLC¥logs

Folder structure for converted installer:

C:\DAC



Summary:

Learned basic conversion method using Desktop App Converter tool

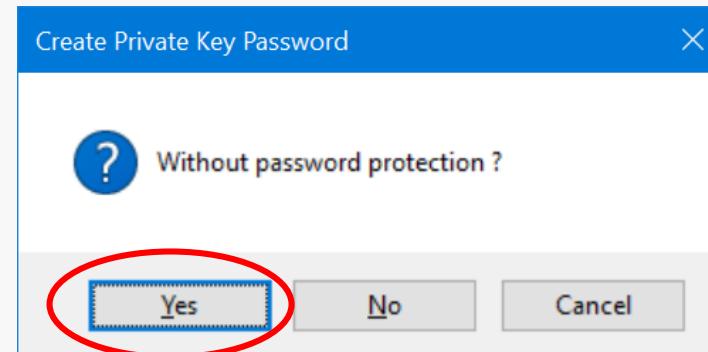
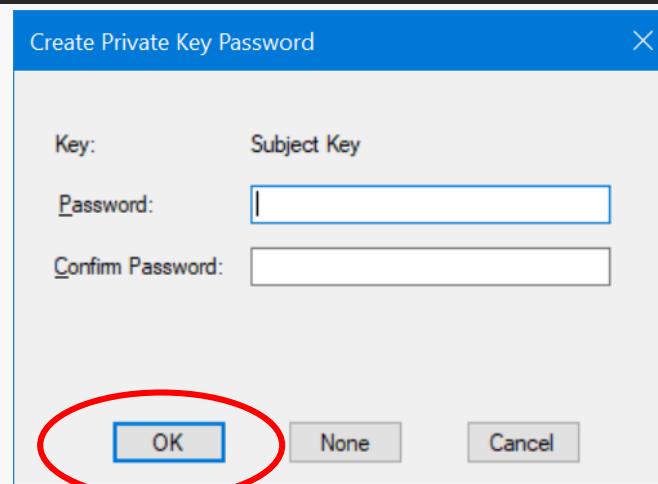
Below link has details on additional parameters:

<https://msdn.microsoft.com/windows/uwp/porting/desktop-to-uwp-run-desktop-app-converter>

Exercise 2: Signing the new Appx

Step 1: Create the Security Certificate:

```
C:\$DAC> CD VLC  
C:\$DAC\$VLC> SET PATH="C:\Program Files  
(x86)\Windows Kits\10\bin\x86";%PATH%  
C:\$DAC\$VLC> makecert.exe -r -h 0 -n "CN=videoLAN" -  
eku 1.3.6.1.5.7.3.3 -pe -sv VLC.pvk VLC.cer  
Succeeded
```



Please Note: When you run MakeCert.exe and asked to enter a password, please select none

Step 2: Create public key and private key copy from certificate (pfx):

```
C:\¥DAC¥VLC> pvk2pfx.exe -pvk VLC.pvk -spc VLC.cer -  
pfx VLC.pfx
```

Under C:\¥DAC¥VLC folder, 3 files are created:

VLC.pfx , VLC.cer , VLC.pvk

Step 3: Signing the Appx:

```
C:\$DAC\$VLC> signtool.exe sign -f VLC.pfx -fd SHA256  
-v VLC.appx
```

The following certificate was selected:

Issued to: videoLAN

Issued by: videoLAN

Expires: Sun Jan 01 08:59:59 2040

SHA1 hash: 3E79B5CC8CA6289F17BC5BF6E436815C18090E1C

Done Adding Additional Store

Successfully signed: VLC.appx

Number of files successfully Signed: 1

Number of warnings: 0

Number of errors: 0

Summary:

Learned how to create certificate for code signing

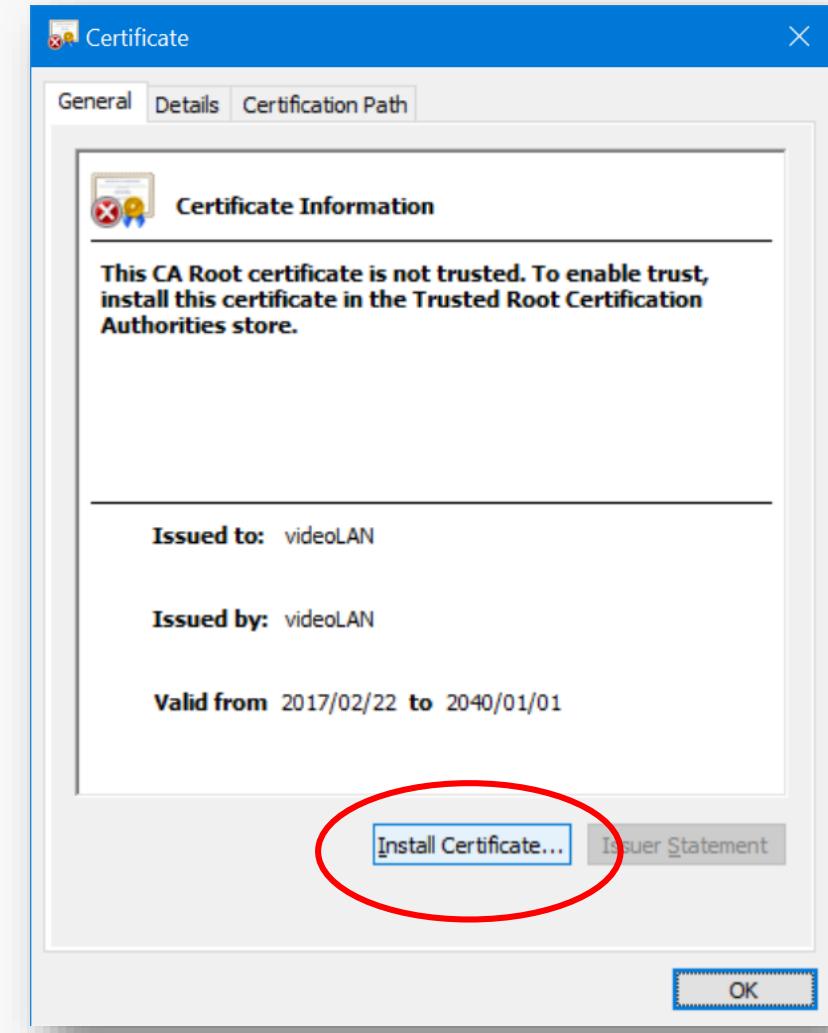
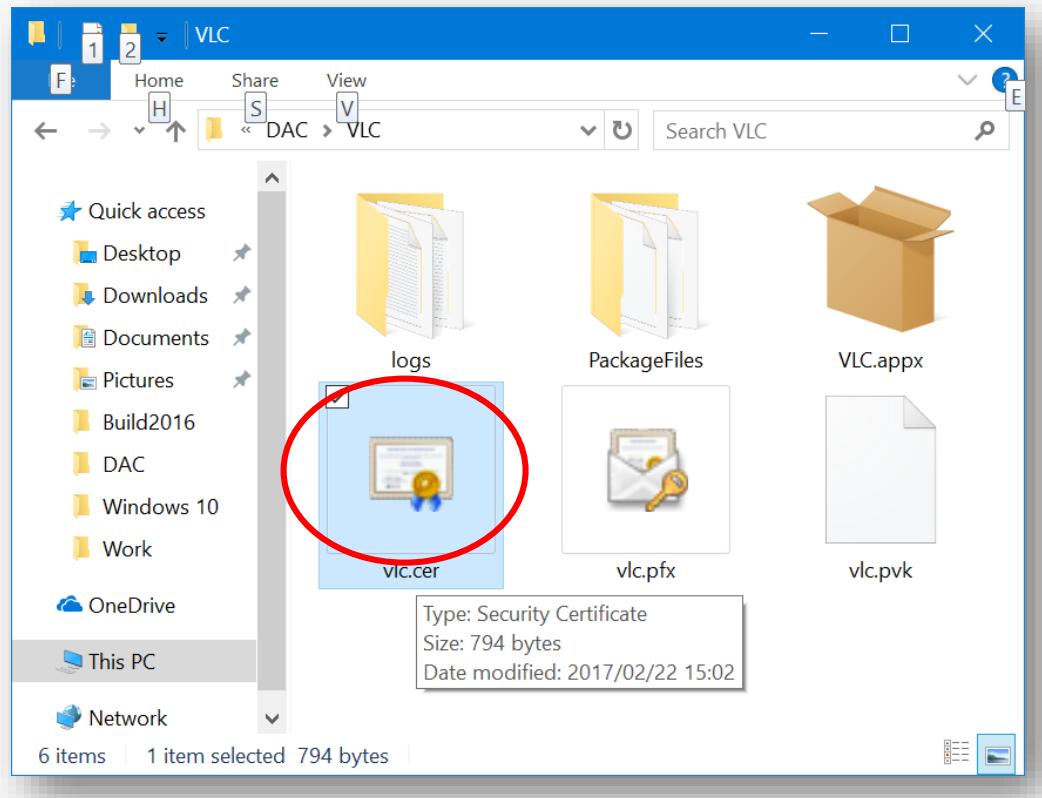
Learned how to sign Appx Package

In next HowTo, learn how to install the Certificate (need to maintain 2 certificates files, pfx and cer)

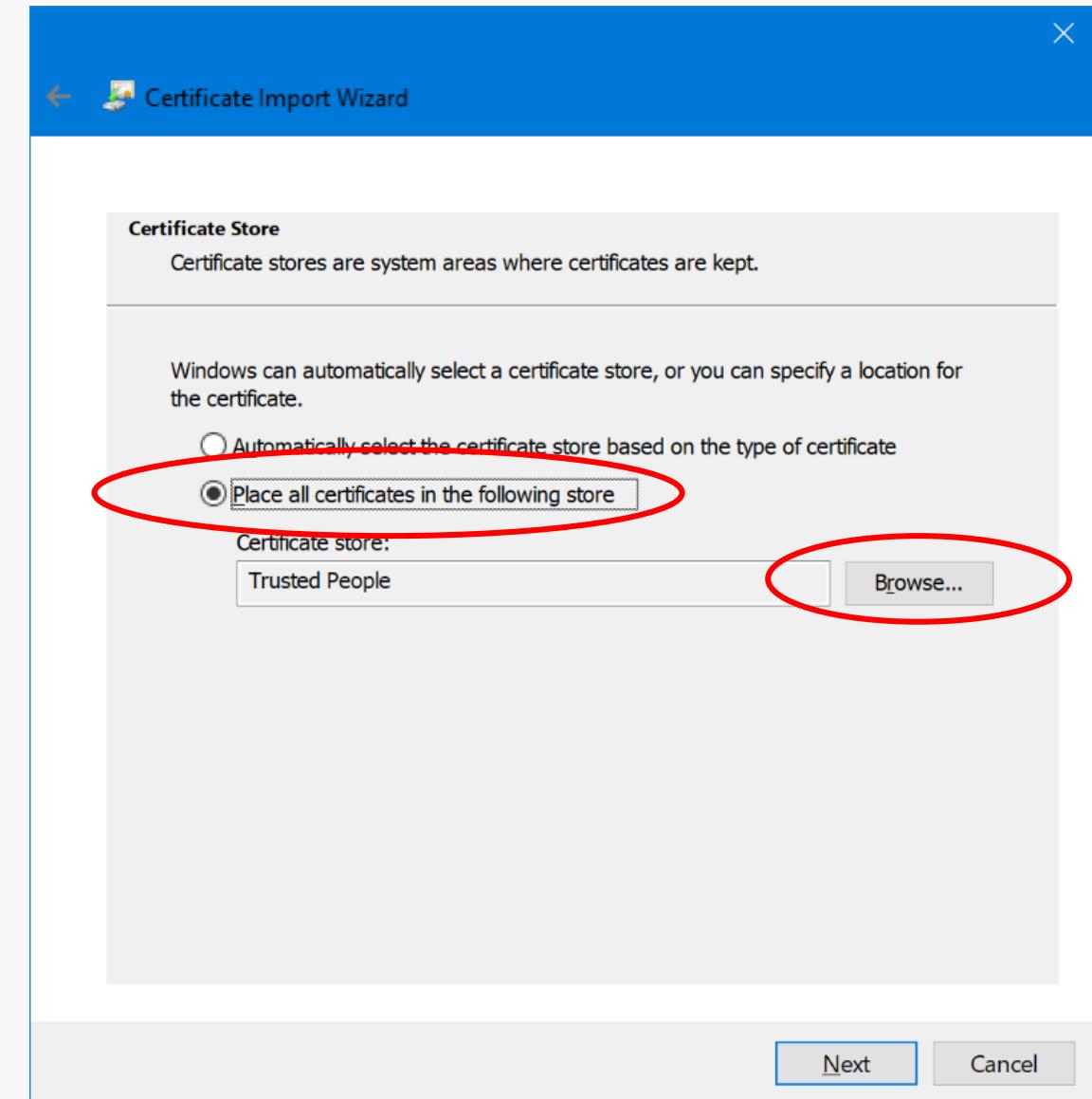
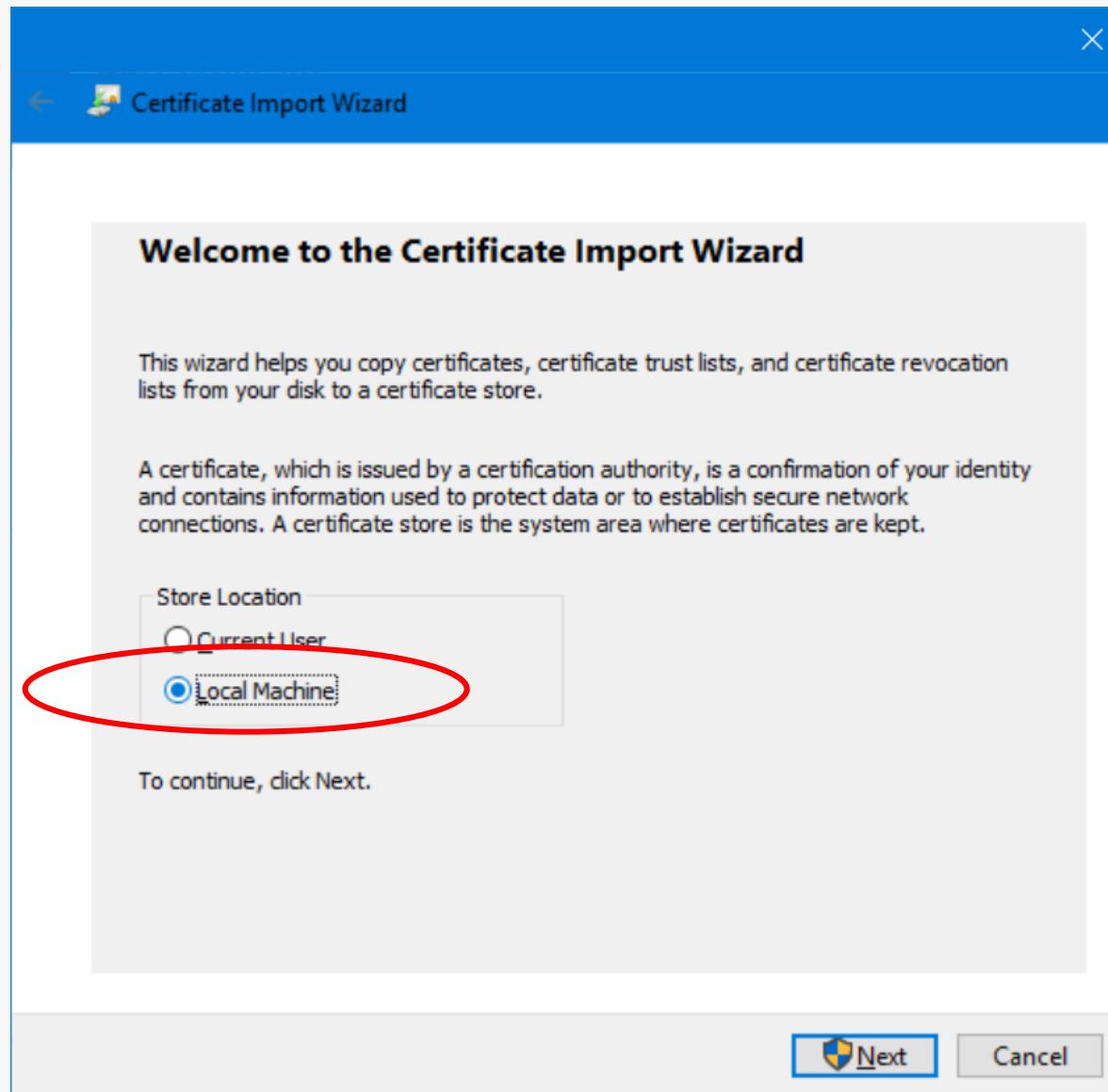
Exercise 3: Installing the converted Appx

Certification Installation (Step 1 of 4):

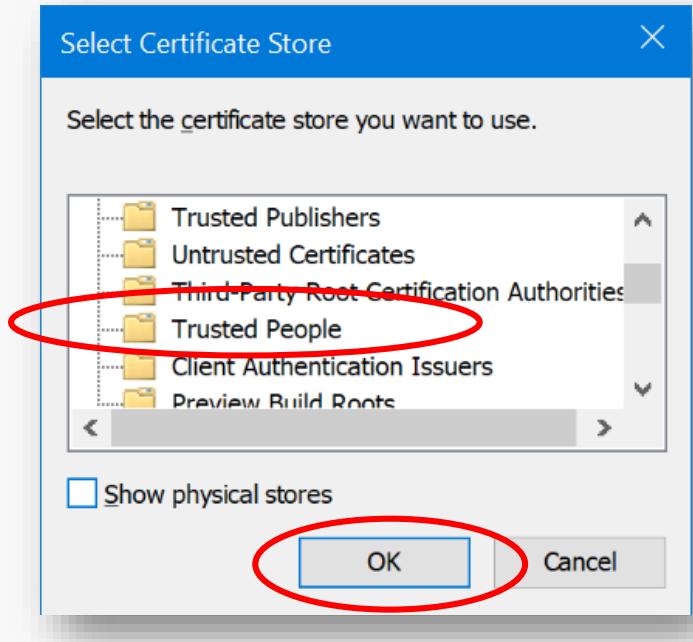
Double click the certificate file in Windows Explorer



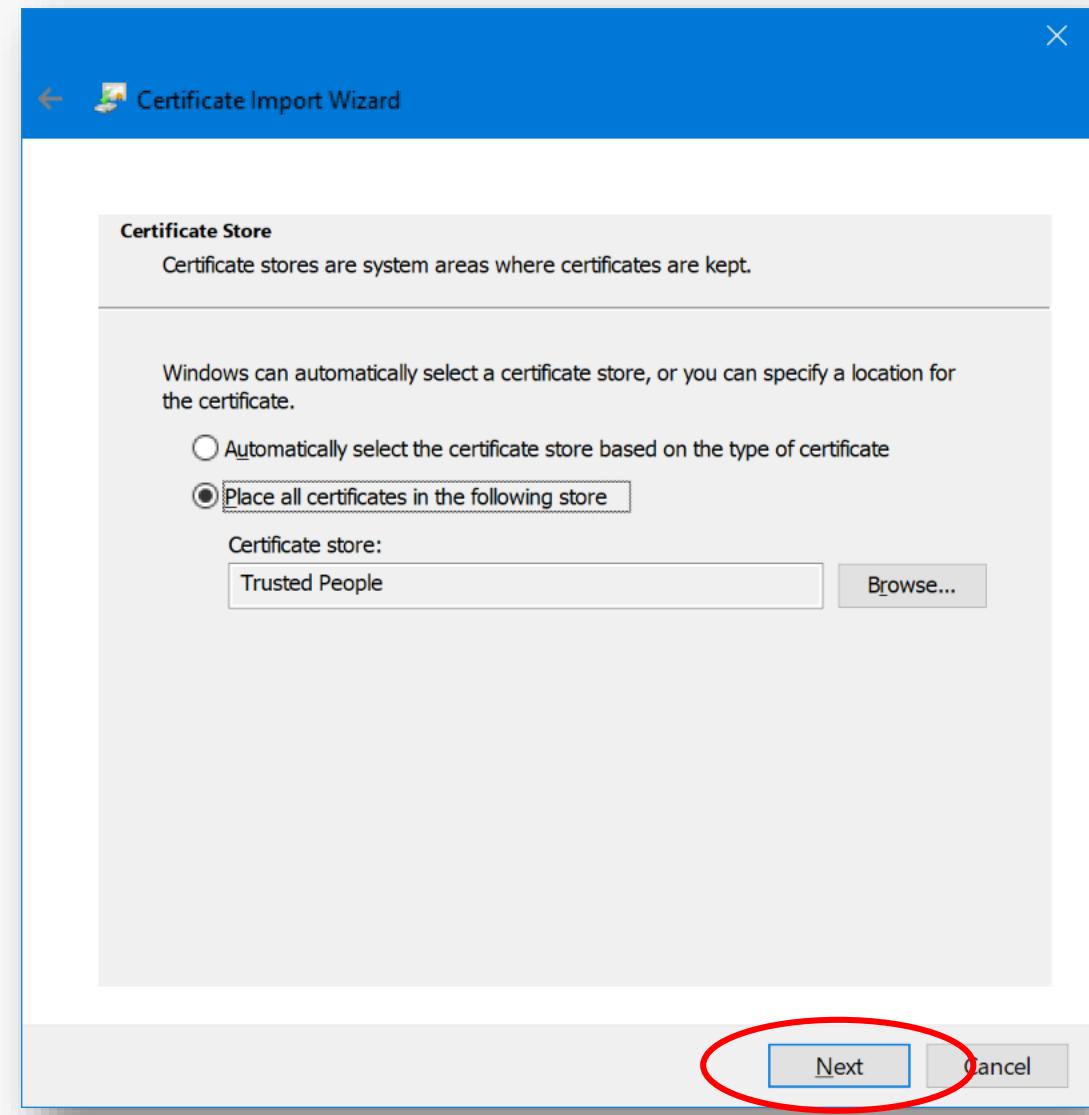
Certification Installation (Step 2 of 4):



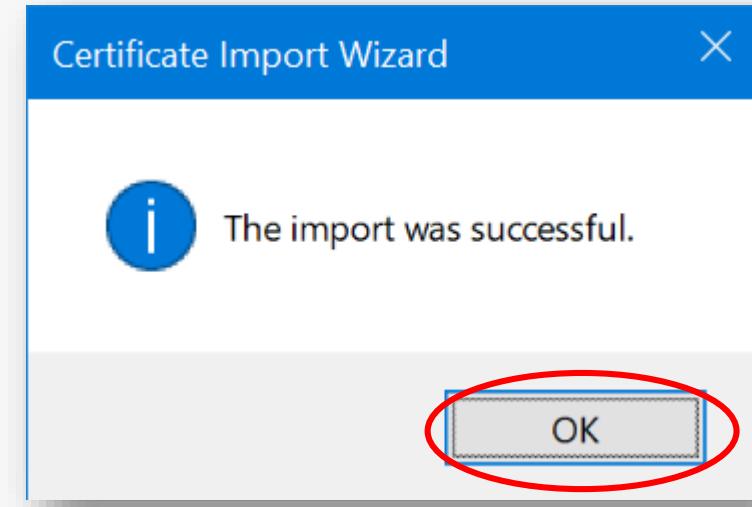
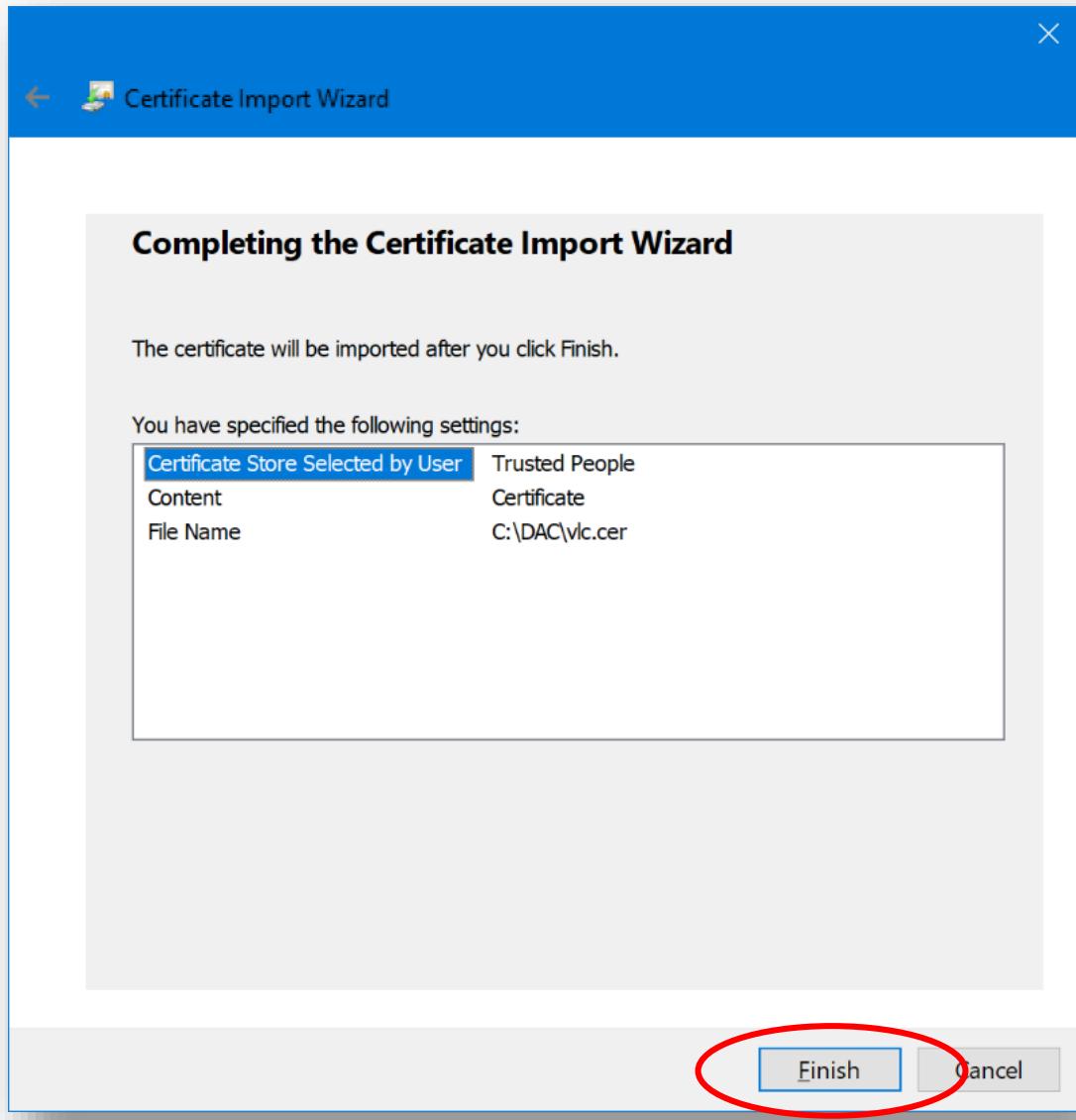
Certification Installation (Step 3 of 4):



Select:
[Local Machine]-[Trusted People] store.

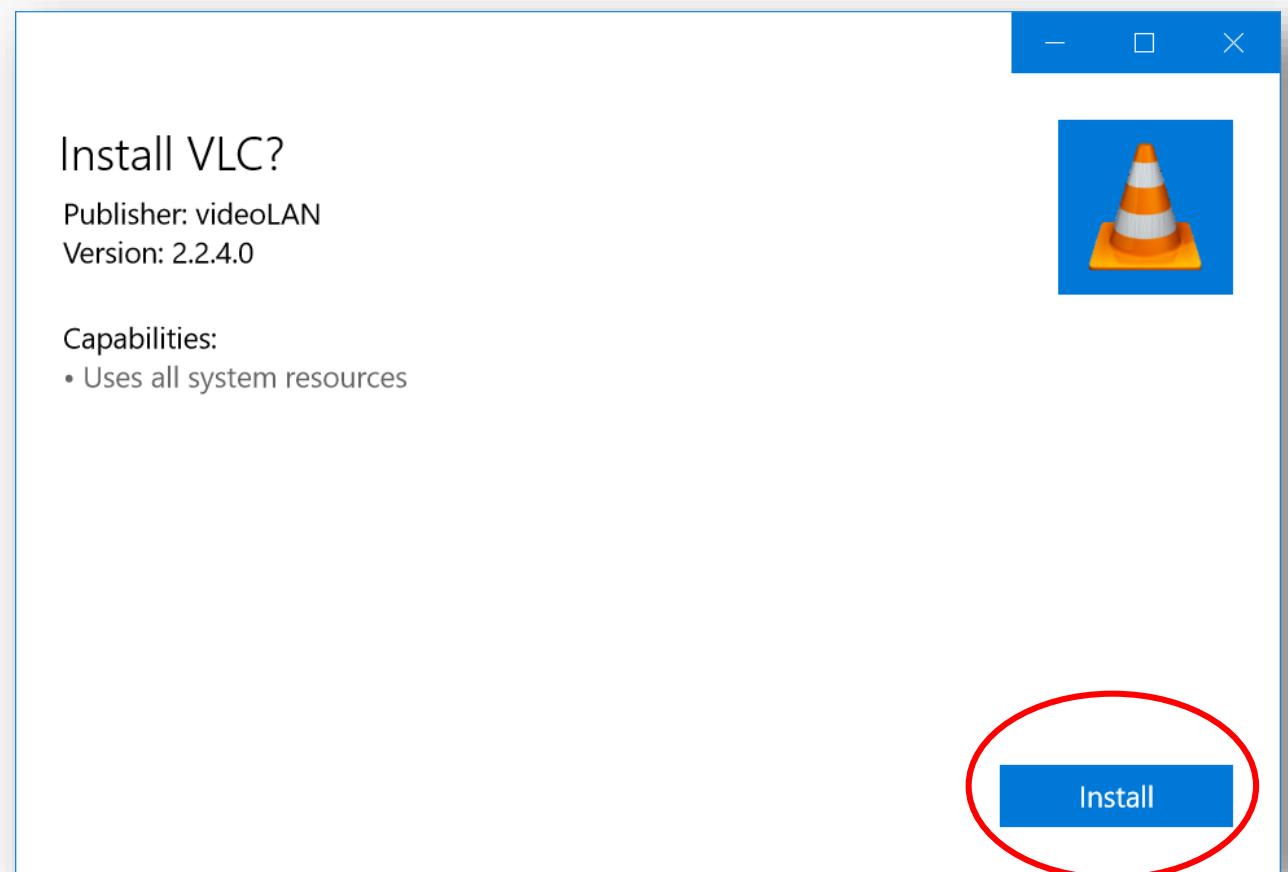
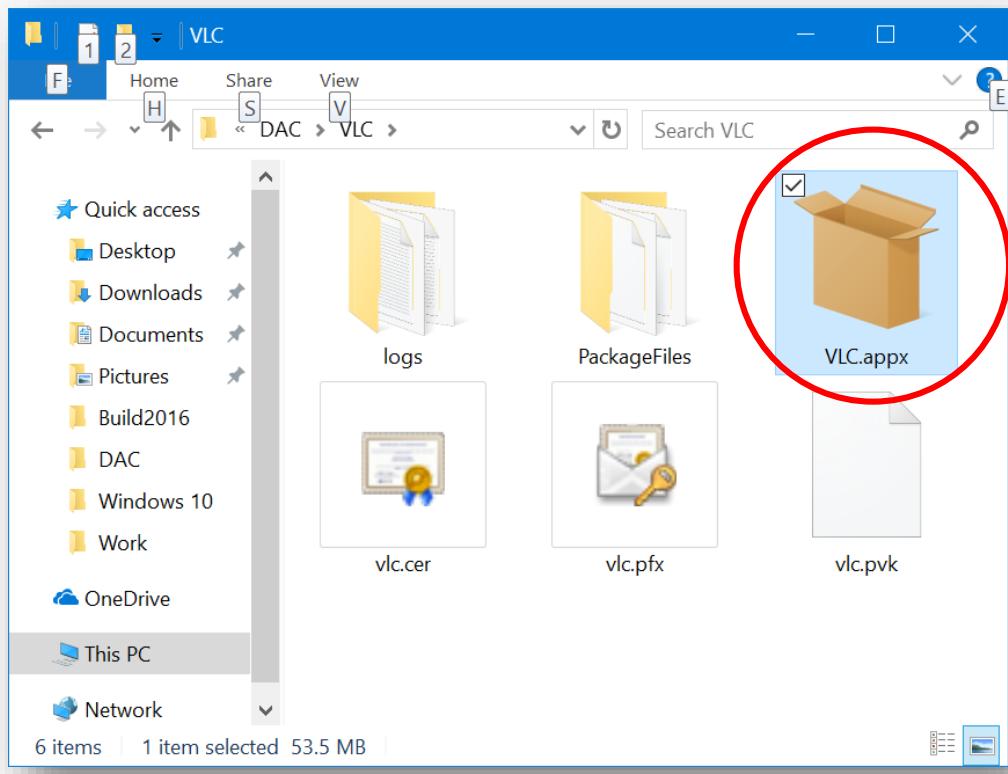


Certification Installation (Step 4 of 4):

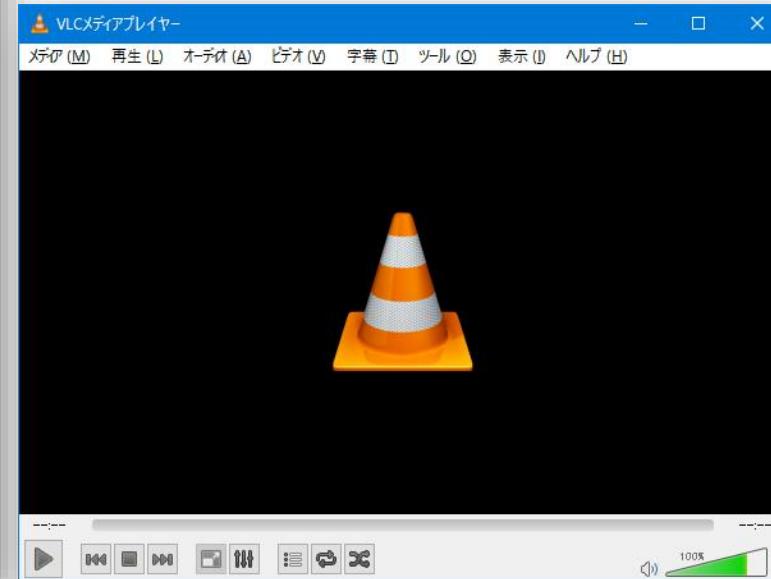
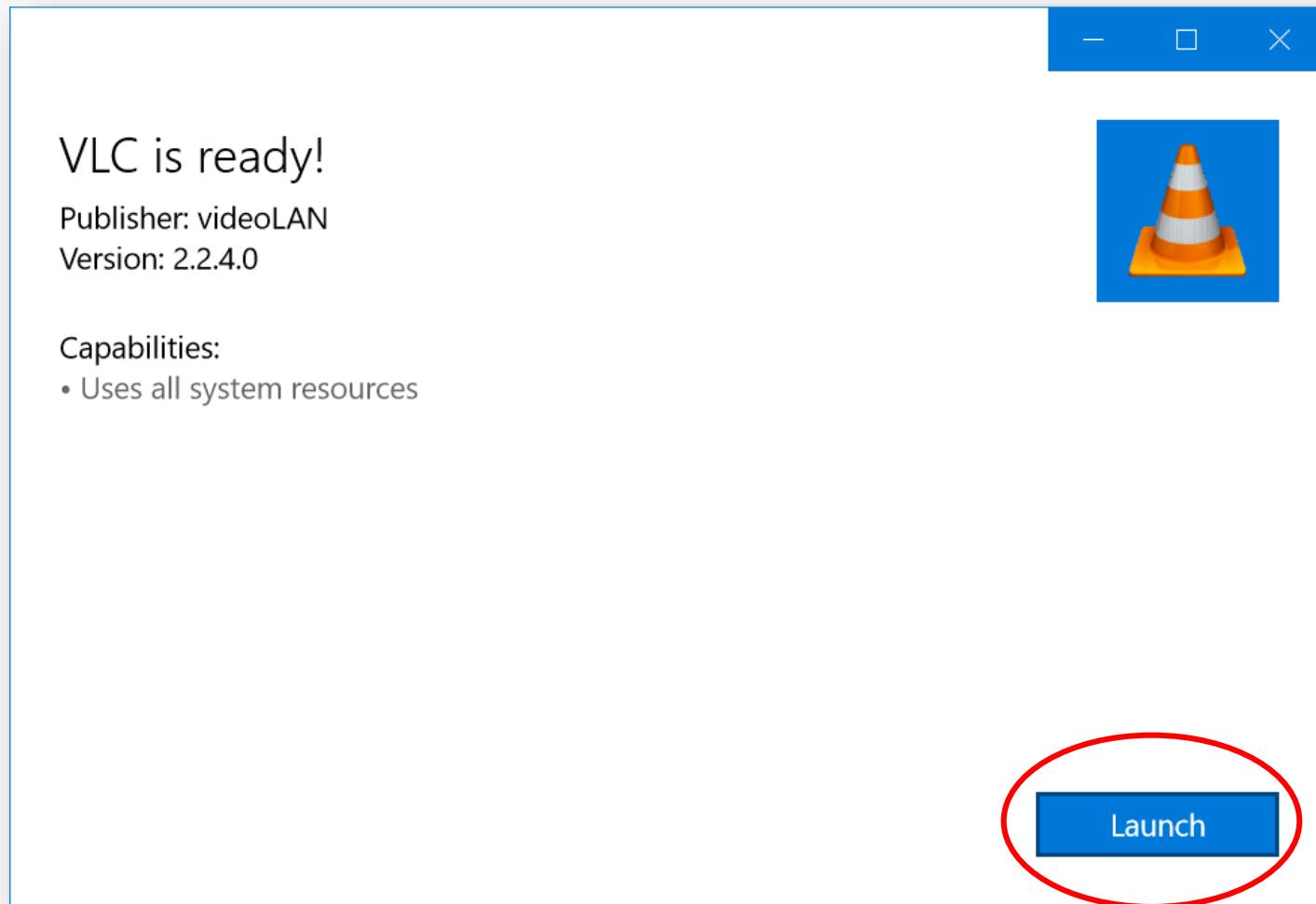


Install App

Double click Appx package file in Windows Explorer



Launch the App



Please note: Confirm launched app's behavior

Additional Info: Installing the App

If unable to install the app by double clicking, please use PowerShell:

```
C:\$DAC\$VLC> powershell  
Windows PowerShell  
Copyright (C) 2016 Microsoft Corporation. All  
rights reserved.
```

```
PS C:\$DAC\$VLC> Add-AppxPackage .\$VLC.appx
```

Summary:

Learned how to install certificate as cer file

Learned how to install Appx package

*Unsigned Appx packages cannot be directly installed.
Please use Add-AppxPackage (PowerShell command-let)
for installing these packages

Exercise 4: Creating PRI resources (optional)

Before trying HowTo 5 & 6, HowTo 4 needs to be completed
Alternatively, you can directly skip to HowTo 7

About PRI

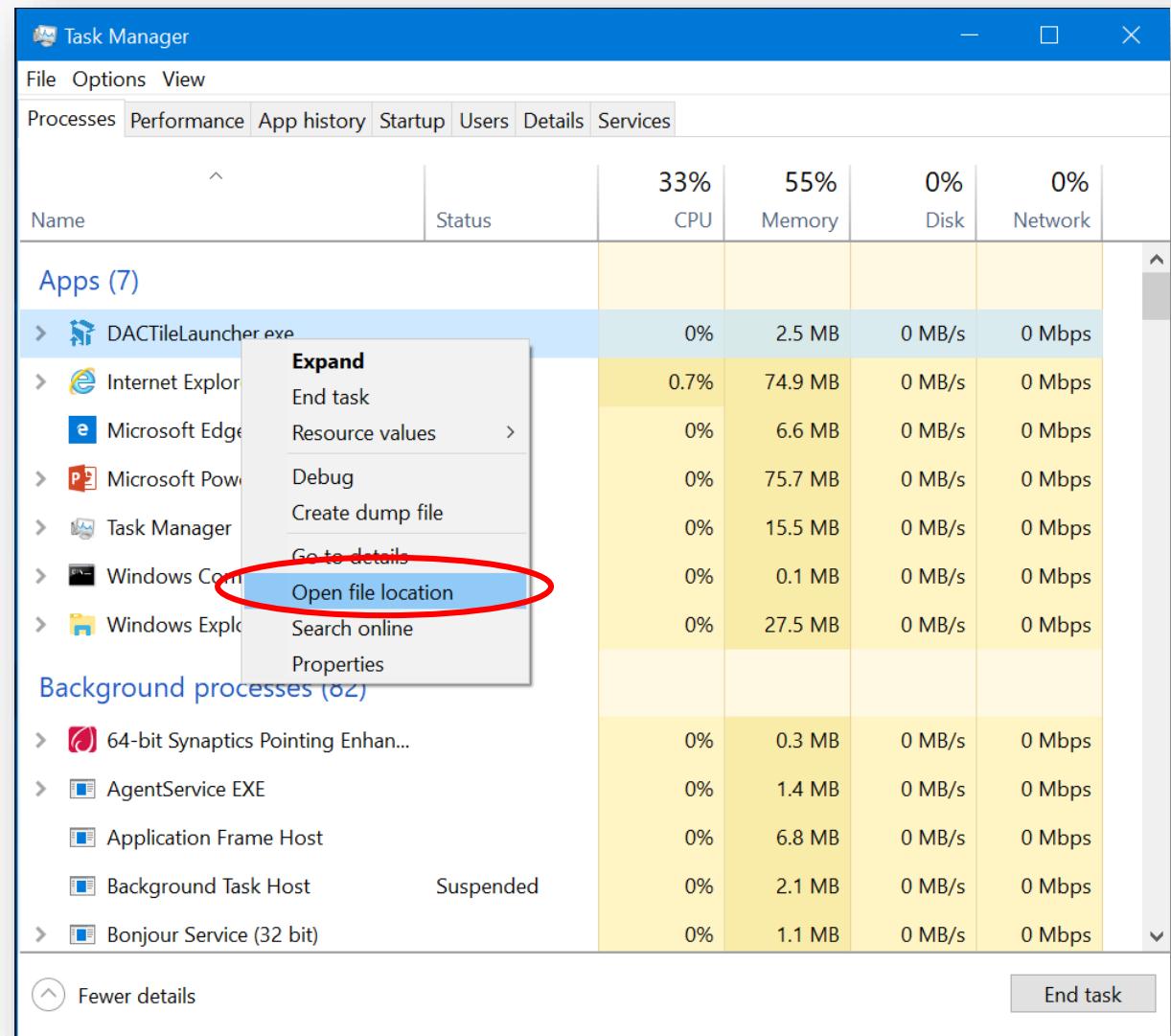
- Provides a new resource manager for UWP App environment. This is different from desktop environment (mui resources)
- New resource manager uses Package Resource Index (PRI) files

This How-To focuses on creating PRI resources

Please Note: If you have changed icon's file name or have added tile icons, you are required to re-create PRI files

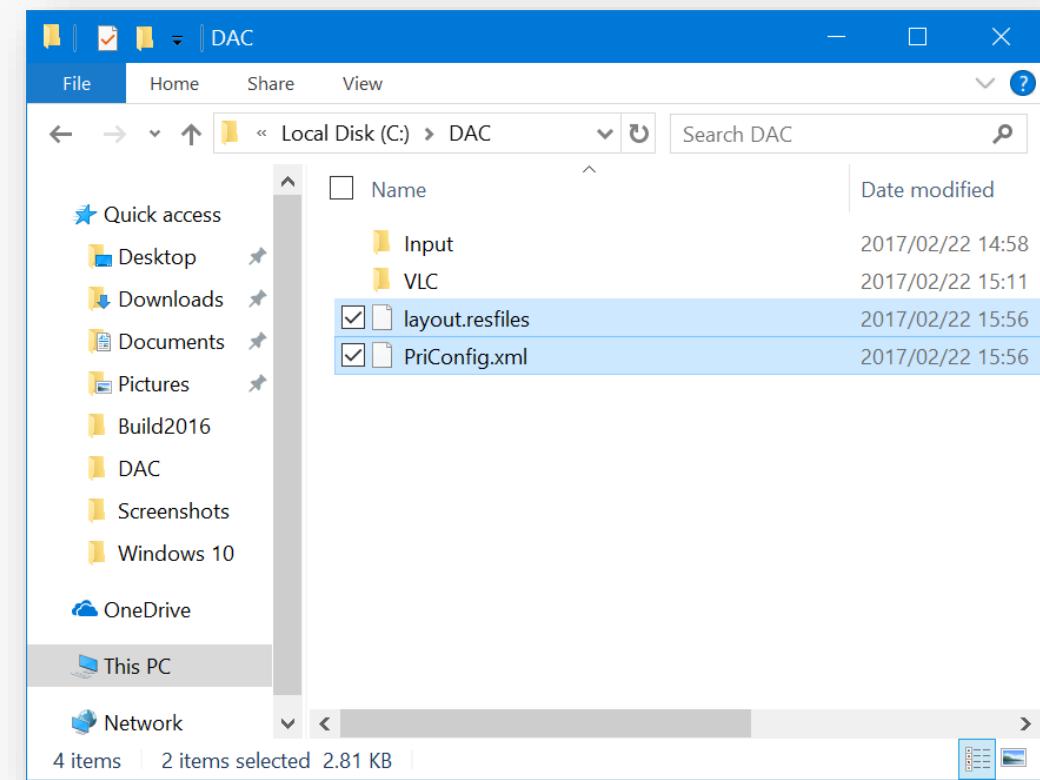
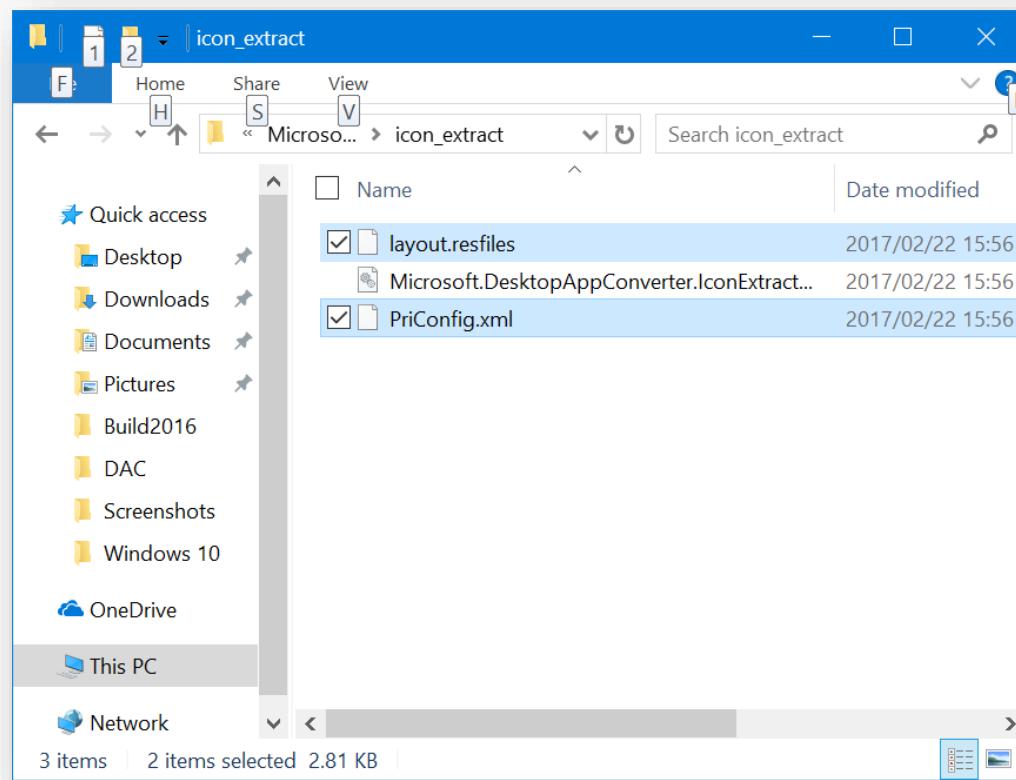
Step 1: Get PRI configuration files

- Launch Desktop App Converter from start menu
- Launch task manager, then select “Open file location” for “DacTileLauncher.exe”



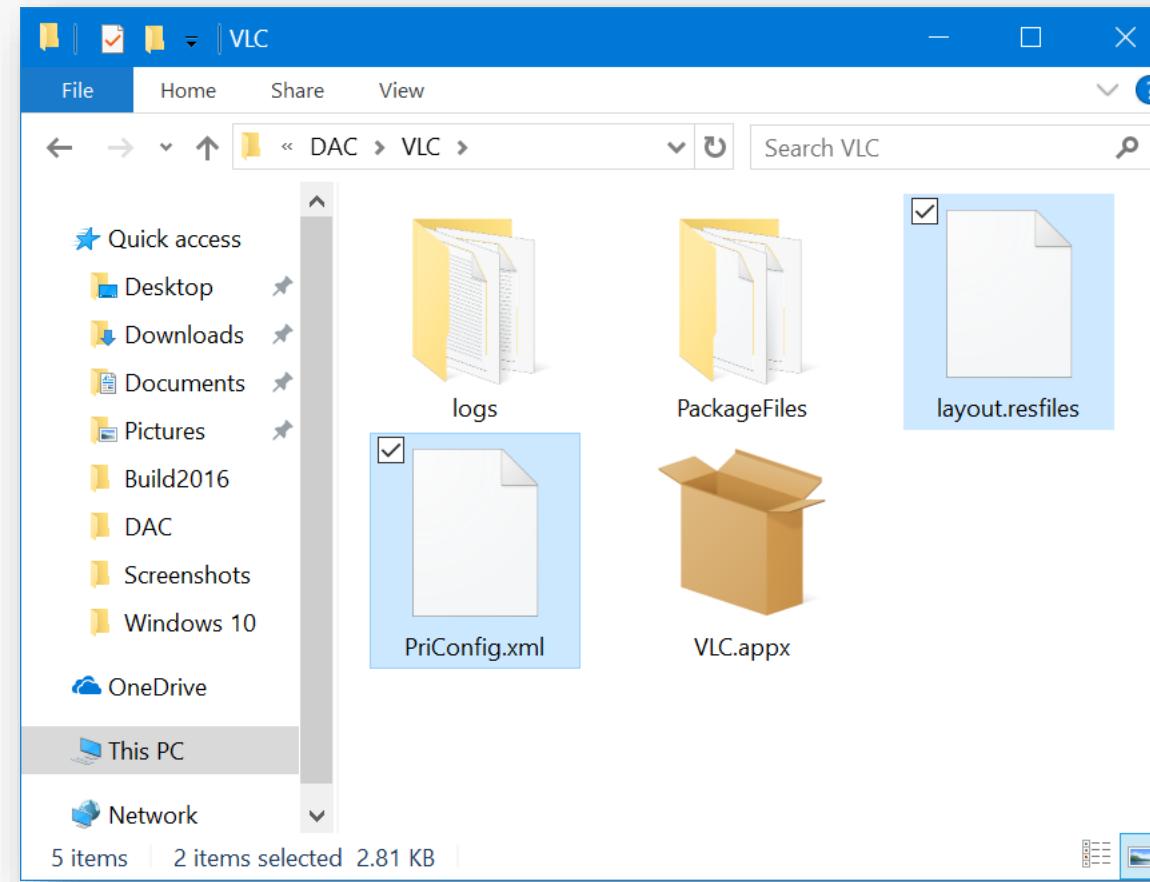
Step 2: Copy PriConfig.xml and layout.resfiles

Open Icon_extract folder, then copy PriConfig.xml and layout.resfiles to C:\DAC folder



Step 3: Copy the 2 files to VLC folder

Copy PriConfig.xml and layout.resfiles to C:\DAC\VLC folder



Step 4: Edit PriConfig.xml

Change definition of layout.resfiles (line #8), in C:¥DAC¥VLV¥PriConfig.xml as below:

Before

```
<index root="¥" startIndexAt="layout.resfiles">
```

After

```
<index root="¥" startIndexAt="..¥layout.resfiles">
```

Step 5: If required, edit layout.resfiles

- layout.resfiles records filename list of VLC¥PackageFiles¥Assets folder content
- layout.resfiles needs to be edited if the assets file has been renamed or if new assets have been added

Please Note: No need to edit the file if there is no change to the Assets folder

Step 6: Delete existing PRI files

Delete PRI Files located at
VLC\PackgeFiles

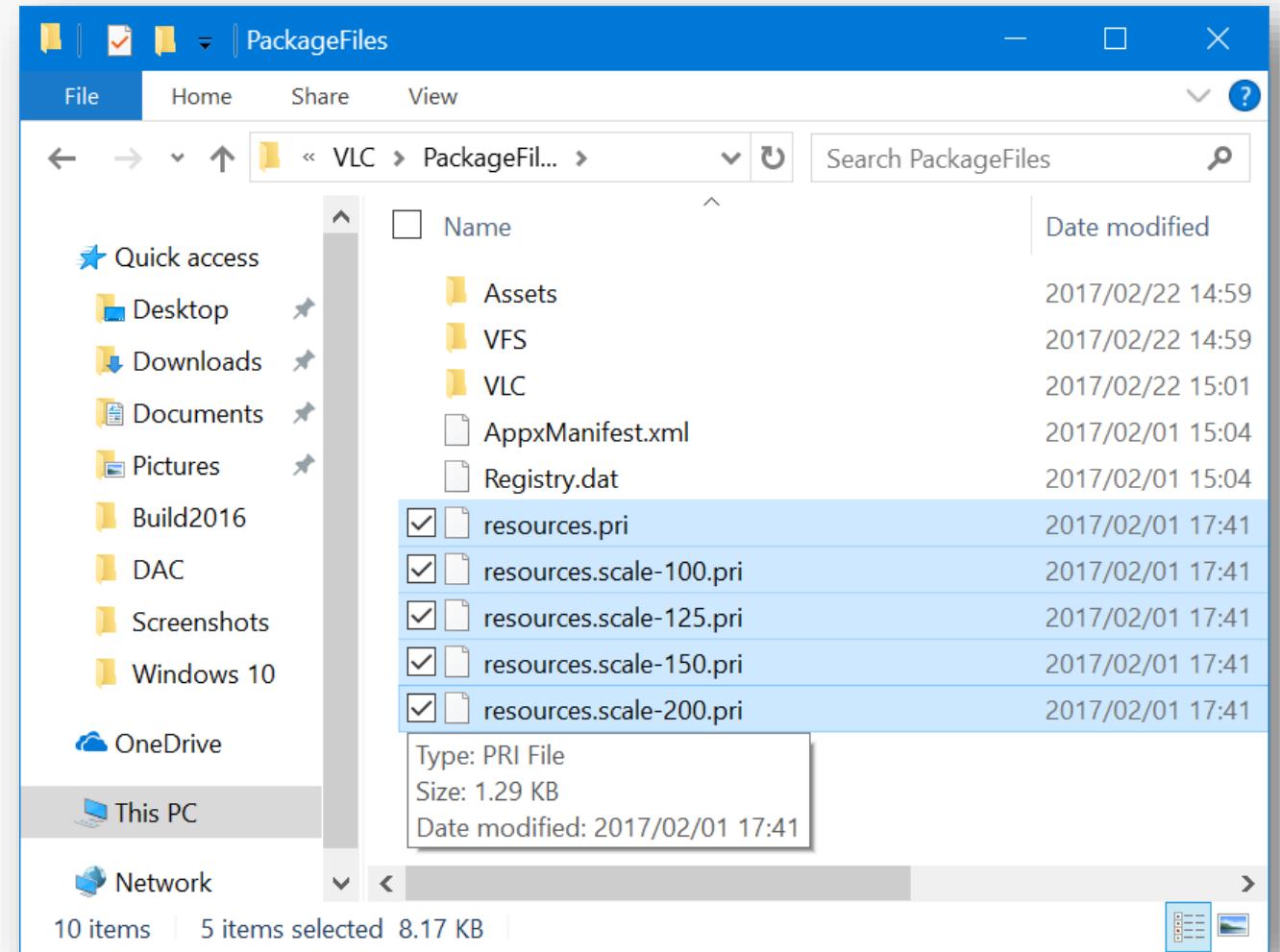
resources.pri

resources.scale-100.pri

resources.scale-125.pri

resources.scale-150.pri

resources.scale-200.pri



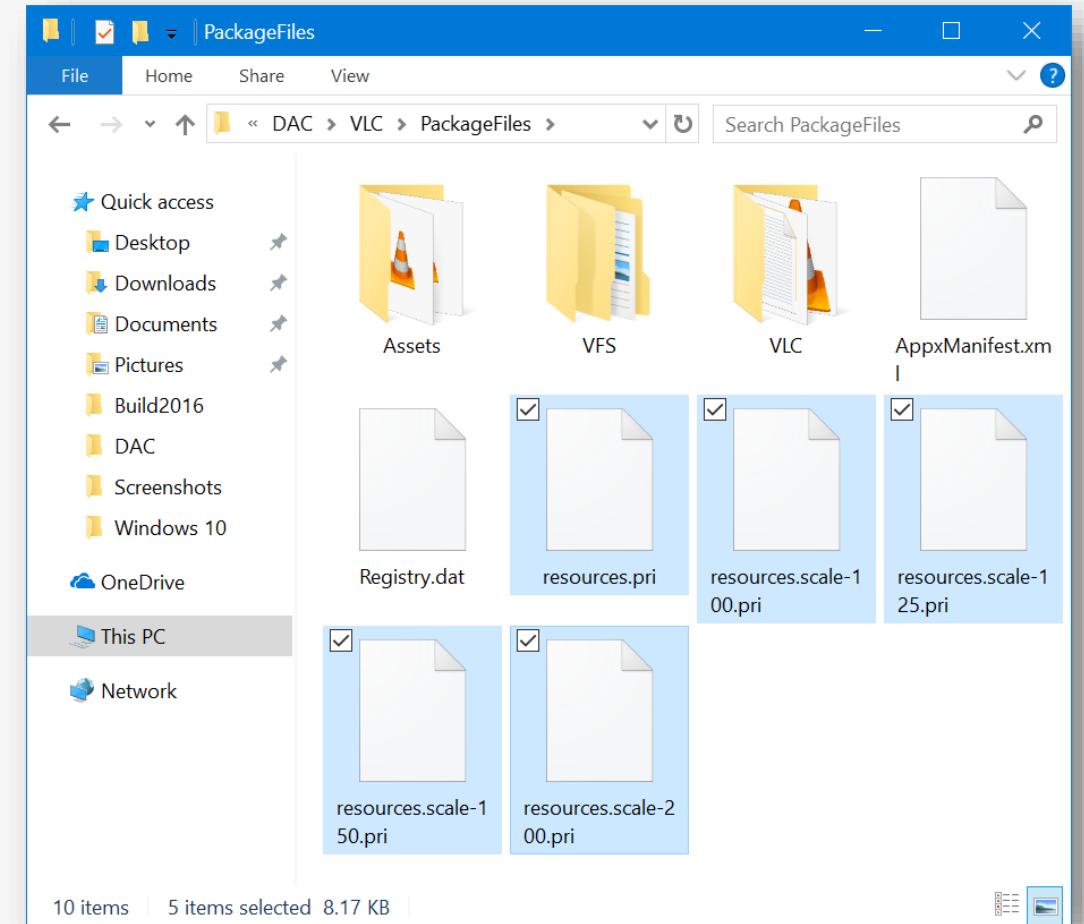
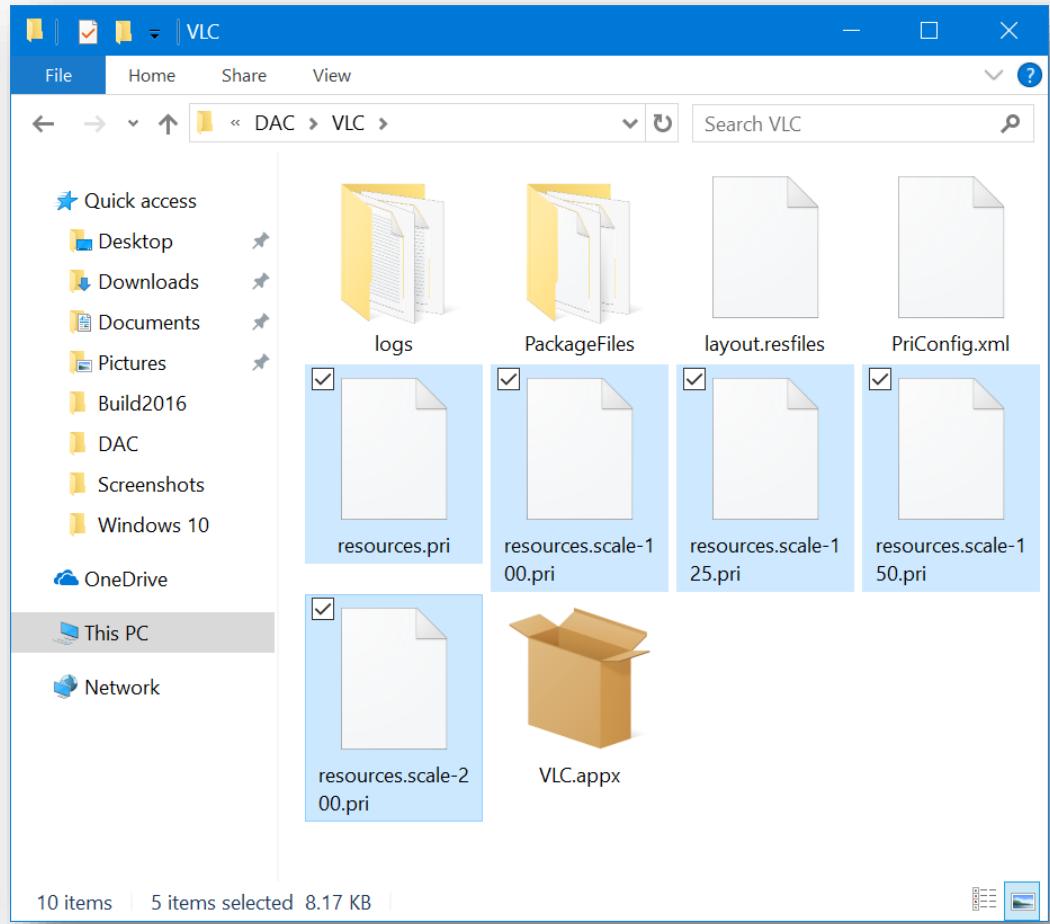
Step 7: Create PRI Files

```
C:\DACP\VLCL> SET PATH="C:\Program Files  
(x86)\Windows Kits\10\bin\x86";%PATH%  
PS C:\DACP\VLCL> makepri.exe new /pr ".\PackageFiles"  
/cf ".\PriConfig.xml" /o  
.....  
Resource File: resources.scale-200.pri  
Version: 1.0  
Resource Candidates: 6  
Scale Qualifiers: 200  
Successfully Completed
```

Once complete, "Successfully Completed" is displayed

Step 8: Copy created PRI files

Copy created PRI files to VLC\PackgeFiles folder



Summary:

Learned how to create PRI files:

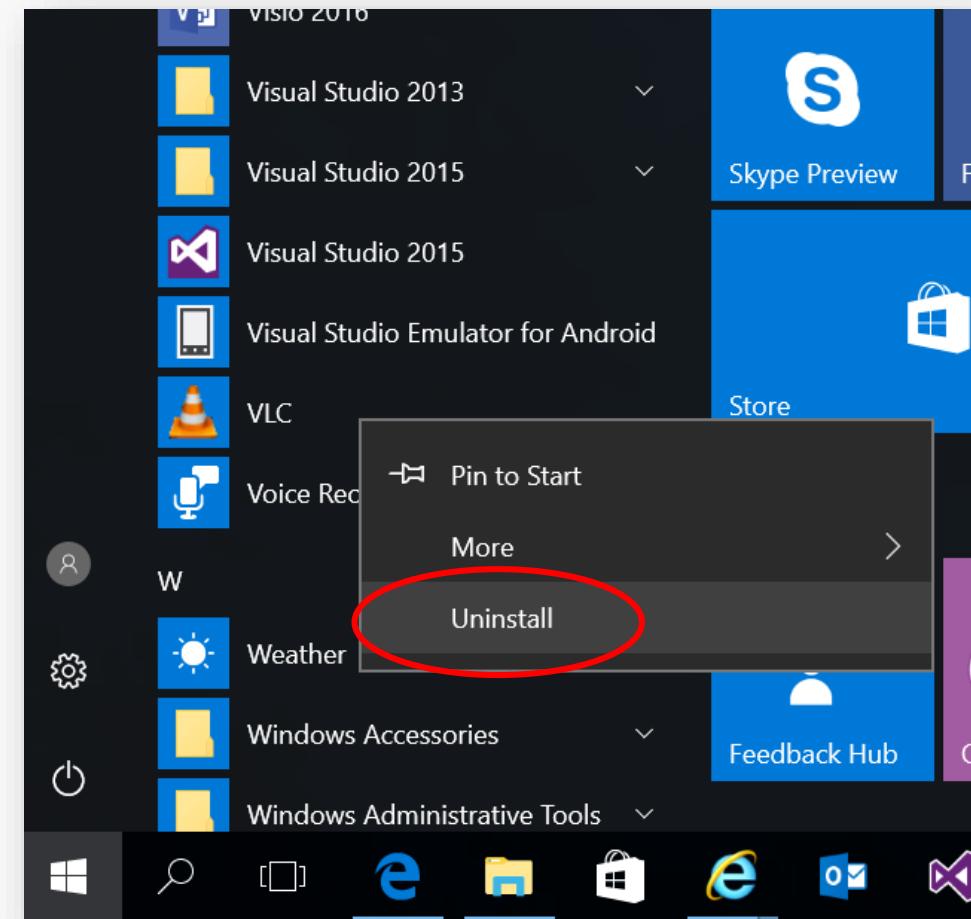
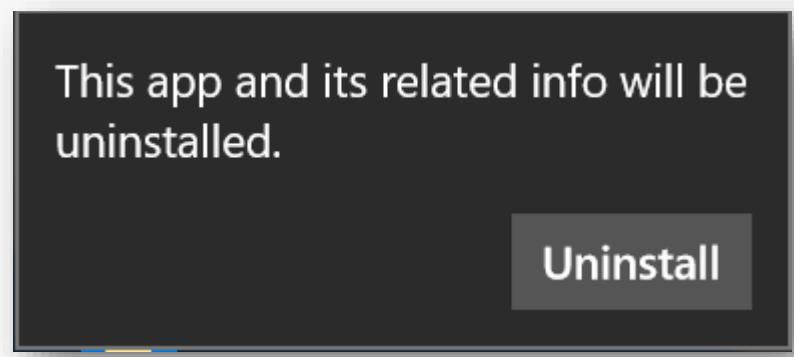
- New resource manager use PRI files
- PRI resources need to be re-created if there is a change to the name or if new assets have been added
- Existing PRI files need to be deleted as makepri defaults to merge mode
- Copy created PRI files to PackageFiles folder

Exercise 5:

Setting up the development environment

Step 1: Uninstall the converted App (Appx)

- Select VLC on start menu
- Select Uninstall on context menu



Step 2: Install App for developer mode

```
C:\DACP\VLCL> powershell  
Windows PowerShell  
Copyright (C) 2016 Microsoft Corporation. All  
rights reserved.
```

```
PS C:\DACP\VLCL> Add-AppxPackage -Register  
.\\PackageFiles\\AppxManifest.xml
```

Please Note: If the executable has been modified, replace the executable in PackageFiles folder and re-test

Summary:

Learned how to install app

Learned how to install app for developer mode:

- After uninstalation replaced the executable file
- If the registry is not modified (HKLM hive), there is no need to re-convert using DAC

Exercise 6:

Creating Appx package using SDK tools

Step 1: Create Appx package

Create Appx package by using makeappx utility:

Appx package creation is complete once you see the "Succeeded" message:

```
C:\DAC\VLC> SET PATH="C:\Program Files  
(x86)\Windows Kits\10\bin\x86";%PATH%  
C:\DAC\VLC> makeappx pack /d .\PackageFiles /l /p  
vlc1.appx  
.....  
.scale-200.pri".  
Package creation succeeded.
```

Step 2: Signing Appx package

Refer Exercise 2 and Exercise 3

In this exercise, created appx package is vlc1.appx

Summary:

Learned manual how to create Appx package:

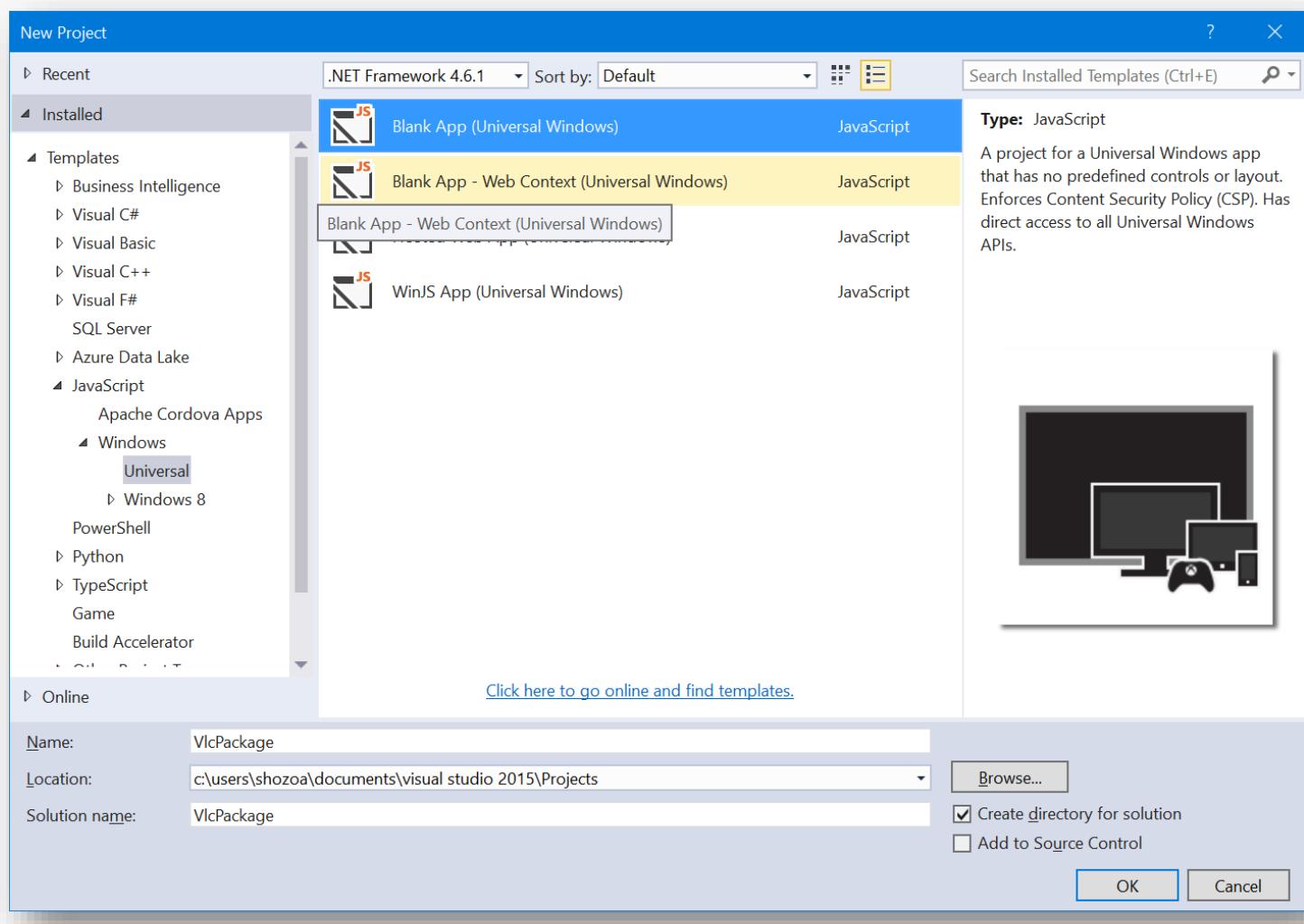
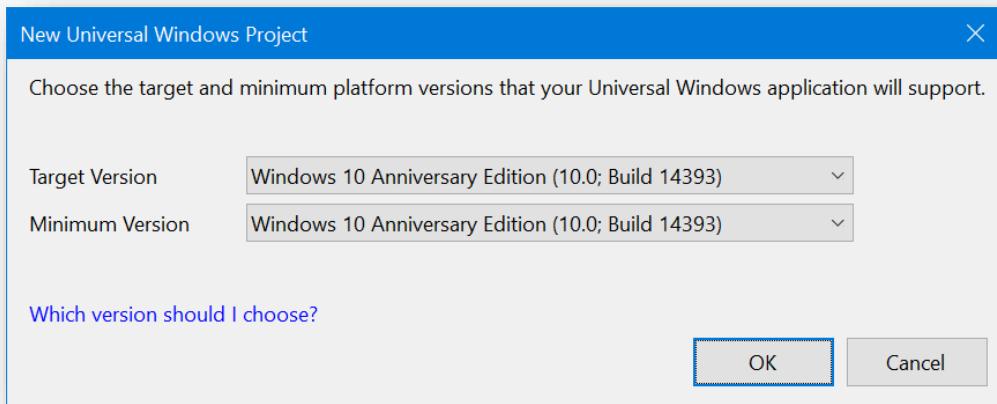
- Appx package needs to be created everytime the AppxManifest (important file having the construct of the Appx layout) is modified
- When using PRI resources, you must use /l option with makeappx utility

Exercise 7:

Creating Appx Package using Visual Studio

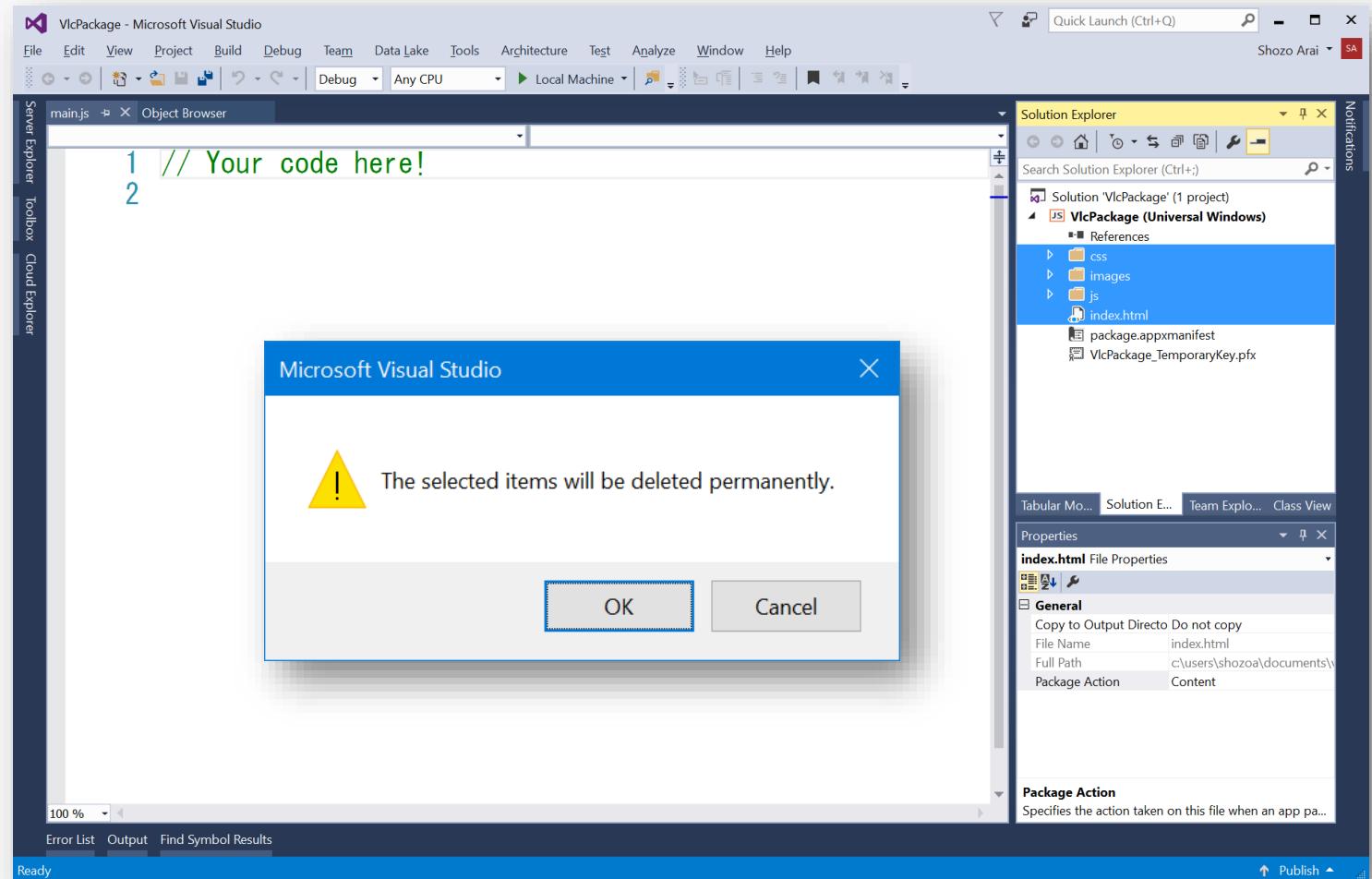
Step 1: Create new Project

- Select [File]-[New]-[Project]
- Create new project using [JavaScript]-[Windows]-[Universal]-[Blank App (Universal Windows)] template



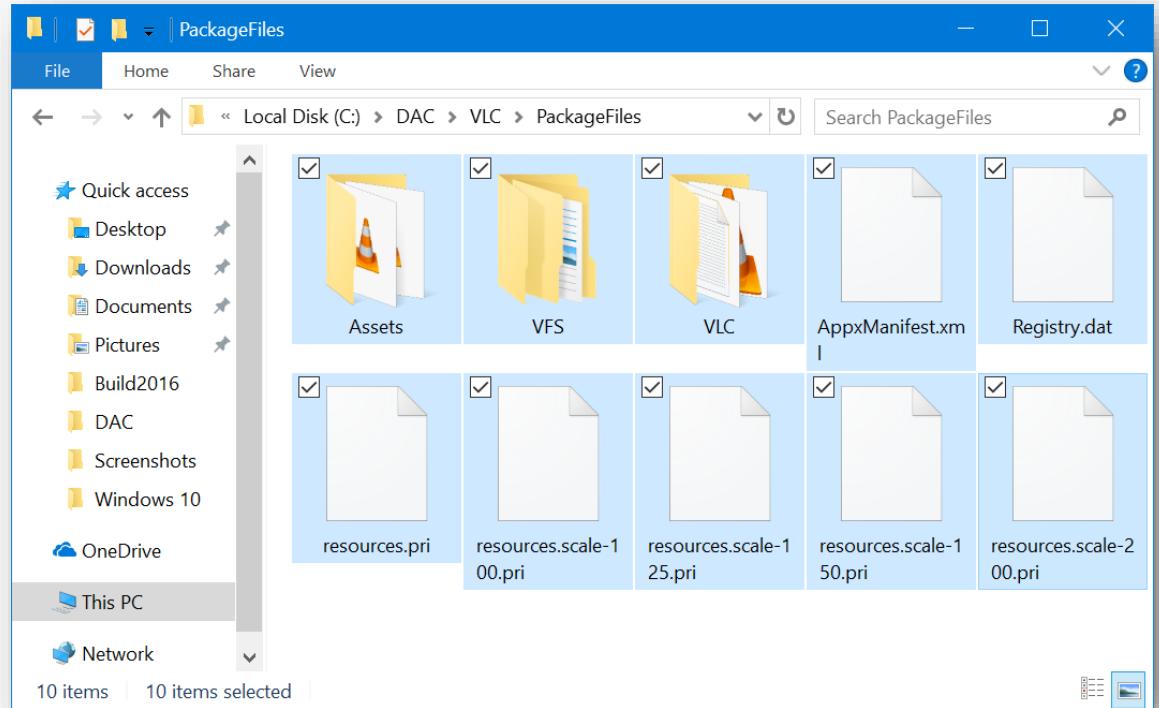
Step 2: Delete exist items from project

- Delete css folder, js folder, images folder and index.html
- Select [Context Menu]-[Delete]



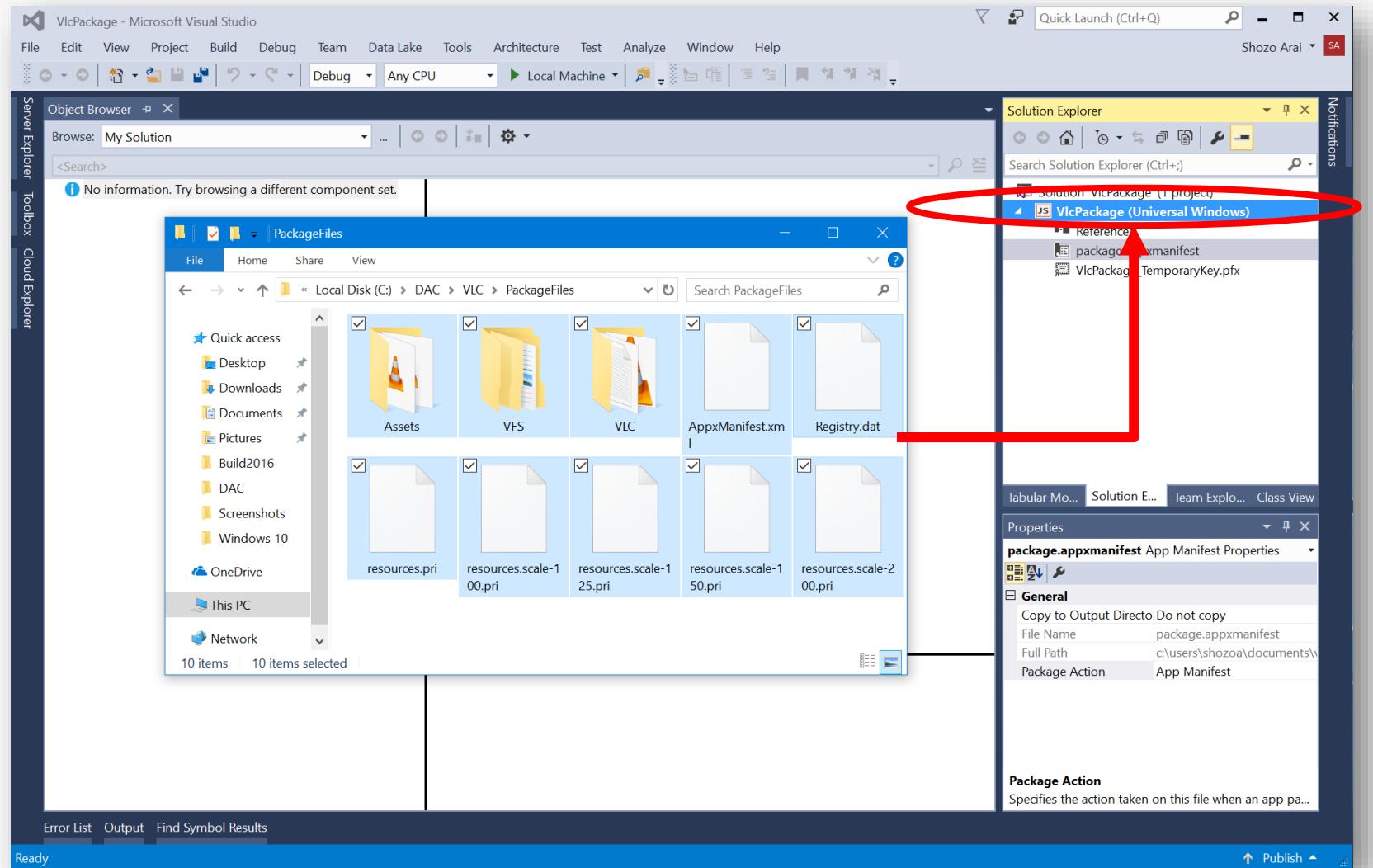
Step 3: Add Appx layout to the project

- Add contents of created C:\DAC\VLC\PackageFiles folder (as Exercise 1)
- Using Windows Explore, Drag & drop C:\DAC\VLC\PackageFiles folder's content to Visual Studio



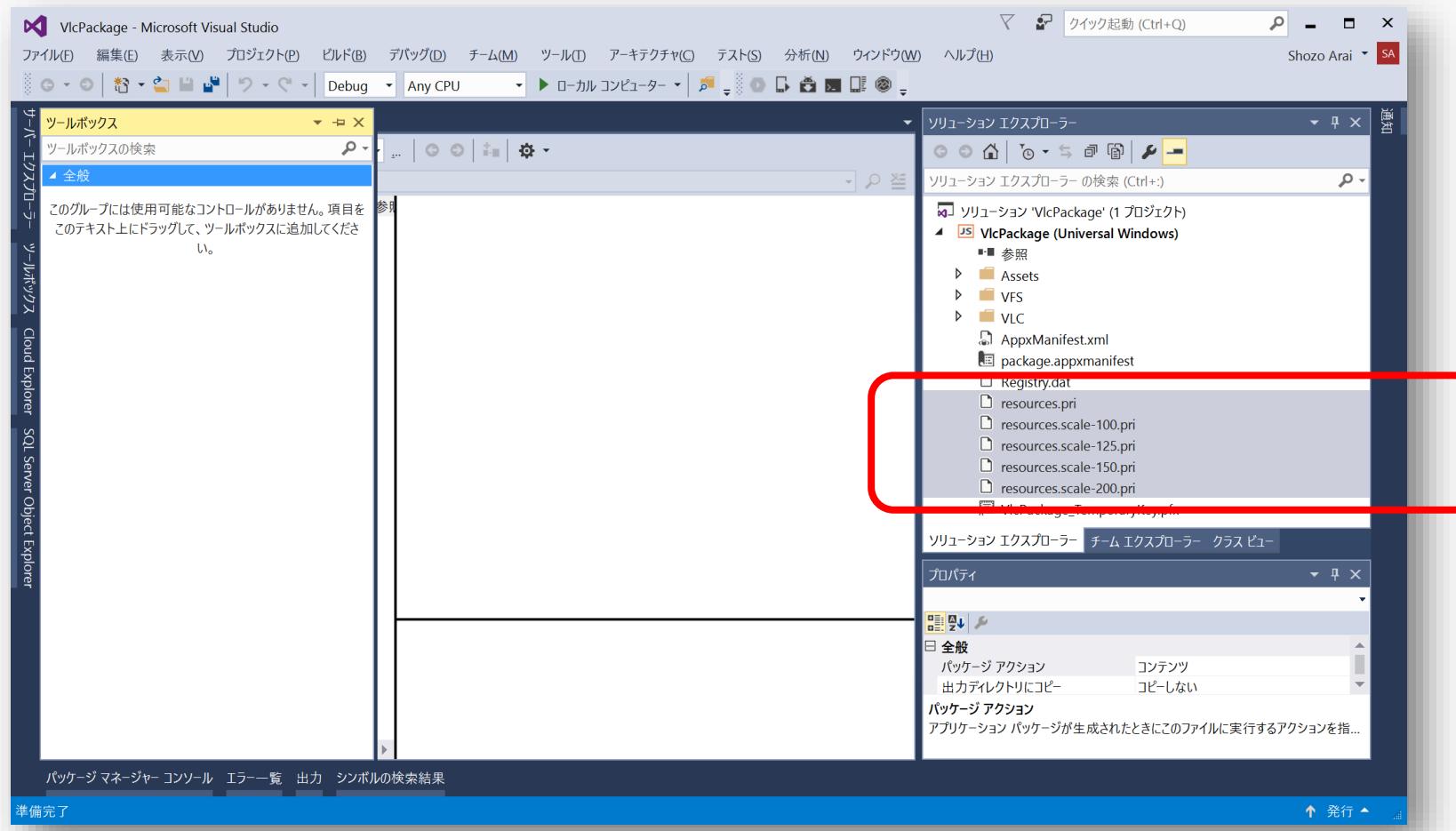
Step 4: Add Appx layout to project

- Drop project on Solution explorer



Step 5: Delete non-required files

- If there are .pri files, delete them



Step 6: Edit Package.appxmanifest

Merge AppxManifest.xml into package.appxmanifest

- Add namespace to Package element
- Modify Identity element
- Replace content from Properties element to Capabilities element

Step 7: Add namespace to Package element

- Modify Package element on 6th line similar to 2nd line
- Add below 4 namespaces

Before

```
<Package  
    xmlns="http://schemas.microsoft.com/appx/manifest/foundation/windows10"  
    xmlns:mp="http://schemas.microsoft.com/appx/2014/phone/manifest"  
    xmlns:uap="http://schemas.microsoft.com/appx/manifest/uap/windows10"  
    IgnorableNamespaces="uap mp">
```

Step 8: Add namespace to Package element

- Modify Package element on 6th line similar to 2nd line

After

```
<Package  
    xmlns="http://schemas.microsoft.com/appx/manifest/foundation/windows10"  
    xmlns:mp="http://schemas.microsoft.com/appx/2014/phone/manifest"  
    xmlns:uap="http://schemas.microsoft.com/appx/manifest/uap/windows10"  
    xmlns:uap2="http://schemas.microsoft.com/appx/manifest/uap/windows10/2"  
    xmlns:uap3="http://schemas.microsoft.com/appx/manifest/uap/windows10/3"  
    xmlns:rescap="http://schemas.microsoft.com/appx/manifest/foundation/windows10/restrictedcapabilities"  
    xmlns:desktop="http://schemas.microsoft.com/appx/manifest/desktop/windows10"  
    IgnorableNamespaces="uap mp uap2 uap3 rescap desktop">
```

Step 9: Modify Identity element

- Modify Identity element on 11th line, similar to 8th line
- Represent content of AppxManifest.xml

Before

```
<Identity  
    Name="57776f58-6df0-43d0-b2f0-94d688609340"  
    Version="1.0.0.0"  
    Publisher="CN=shozoa" />
```

Step 10: Modify Identity element

- Modify Identity element on 11th line similar to 8th line
- Represent content of AppxManifest.xml

After

```
<Identity  
    Name="VLC"  
    ProcessorArchitecture="x86"  
    Version="2.2.4.0"  
    Publisher="CN=shozoa" />
```

Please Note: Please do not modify the Name, ProcessorArchitecture, Version and Publisher attributes

Step 11: Replace content under Properties element

- Replace contents on 50th line to 15th line

Before

```
<Properties>
    <DisplayName>VlcPackage</DisplayName>
    <PublisherDisplayName>shozoa</PublisherDisplayName>
    <Logo>images\storelogo.png</Logo>
</Properties>
```

.....

```
<Capability Name="internetClient" />
</Capabilities>
```

Step 12: Replace content under Properties element

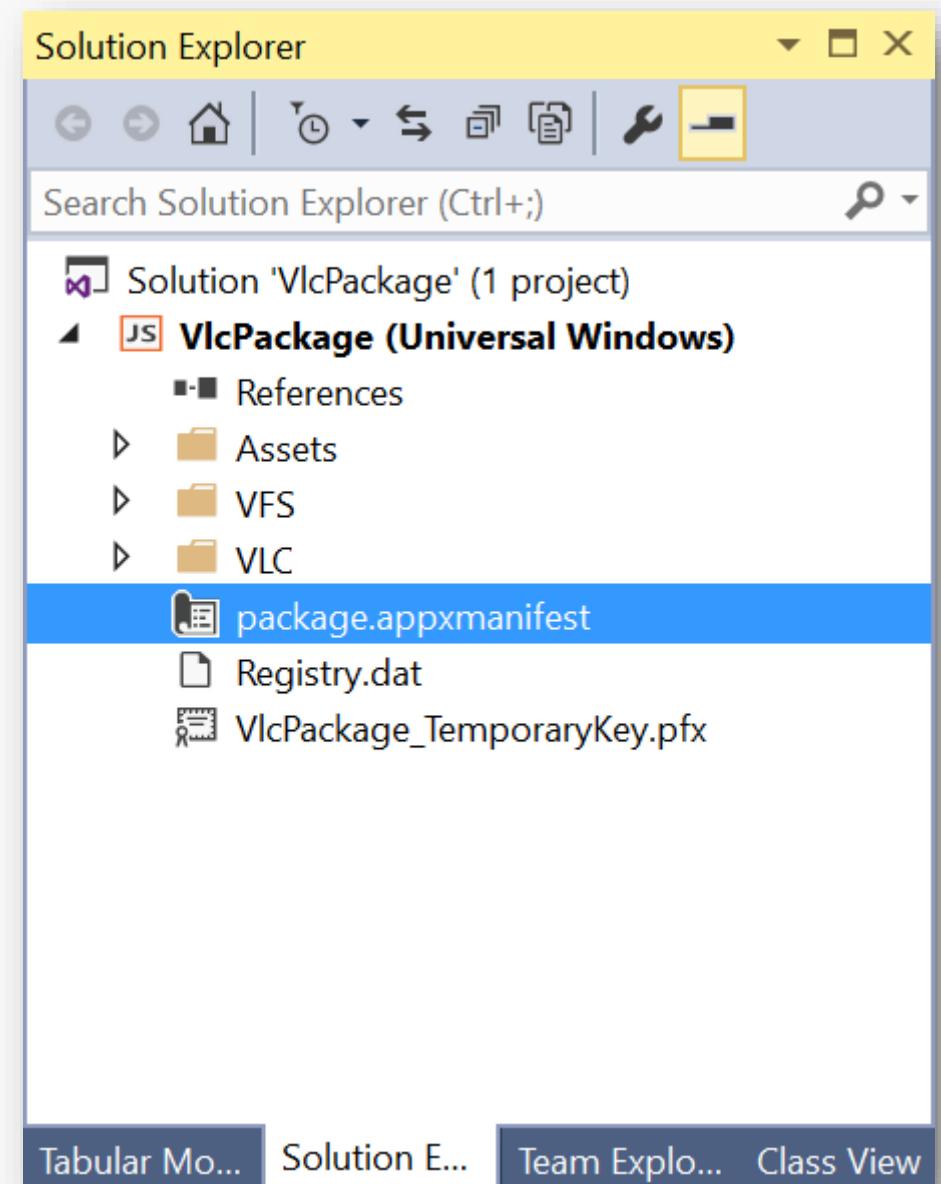
- Replace contents on 50th line from 15th line

After

```
<Properties>
    <DisplayName>VLC</DisplayName>
    <PublisherDisplayName>videoLAN</PublisherDisplayName>
    <Logo>Assets\AppStoreLogo.png</Logo>
</Properties>
.....
    </Application>
</Applications>
```

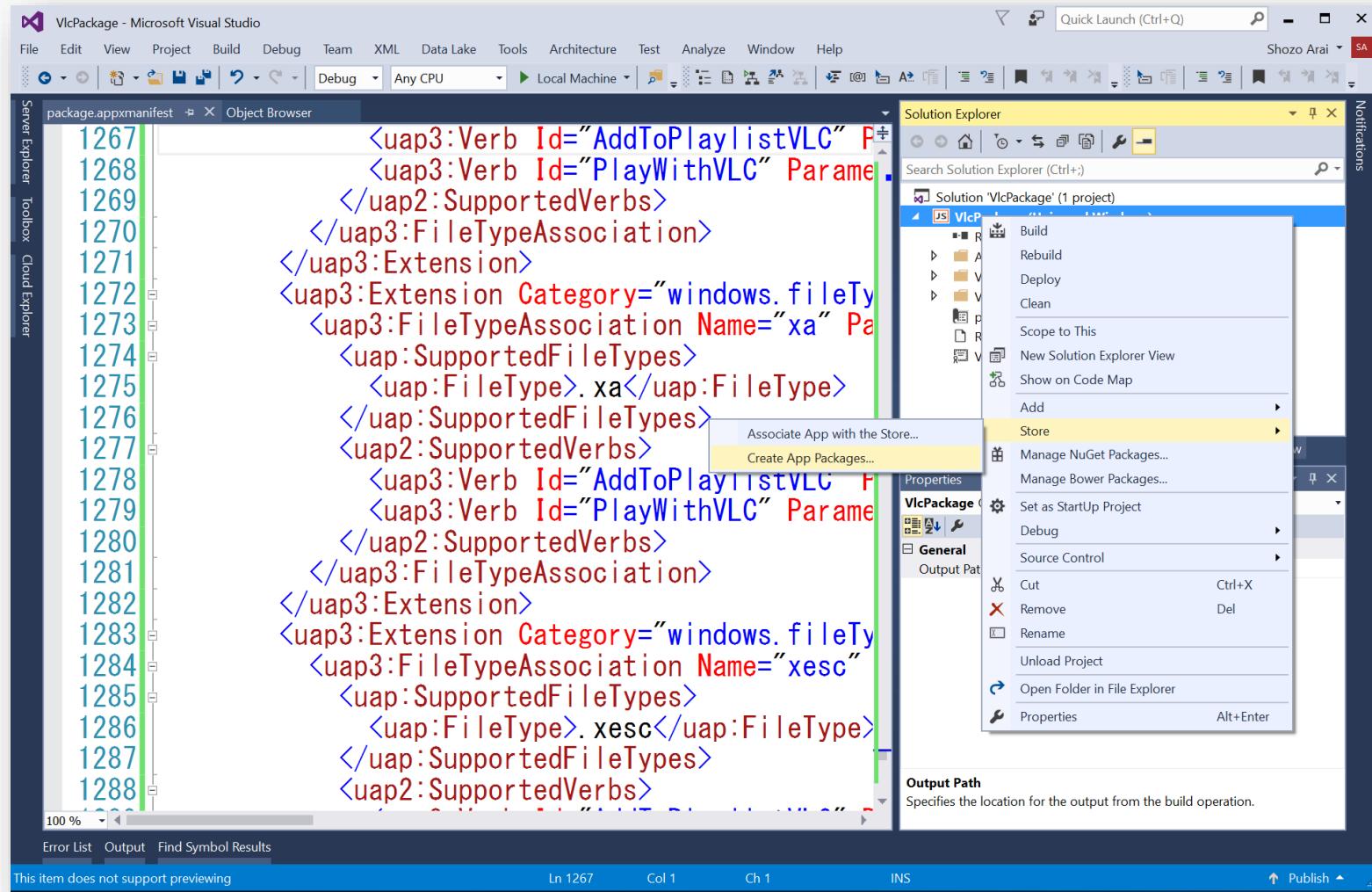
Step 13: Delete un-required items from the project

- After editing Package.appxmanifest, delete AppxManifest.xml from the project



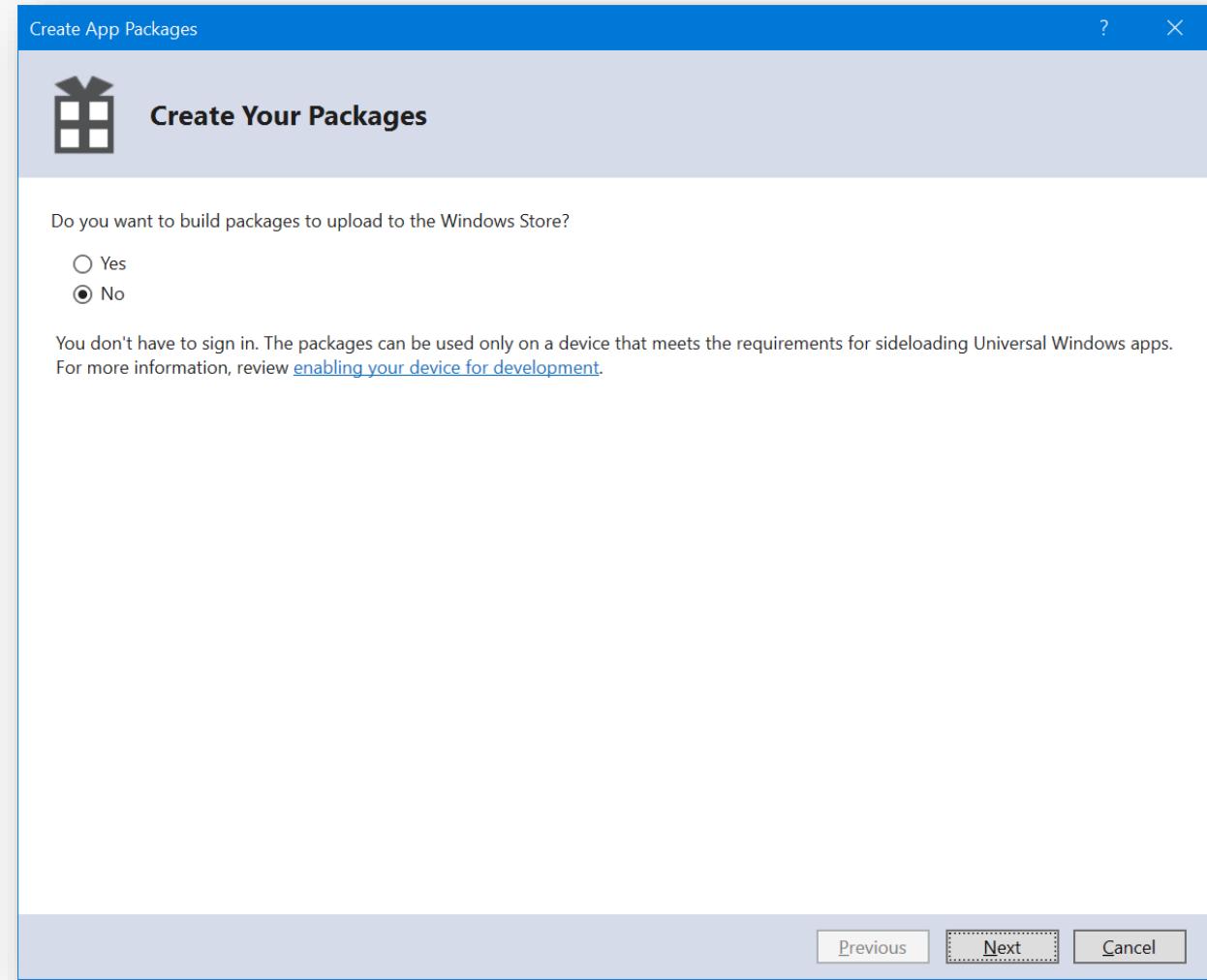
Step 14: Create Appx package (1 of 4)

Select [Store]-[Create app packages...]



Step 15: Create Appx package (2 of 4)

- Select “Do you want to build packages to upload to the Windows Store?”



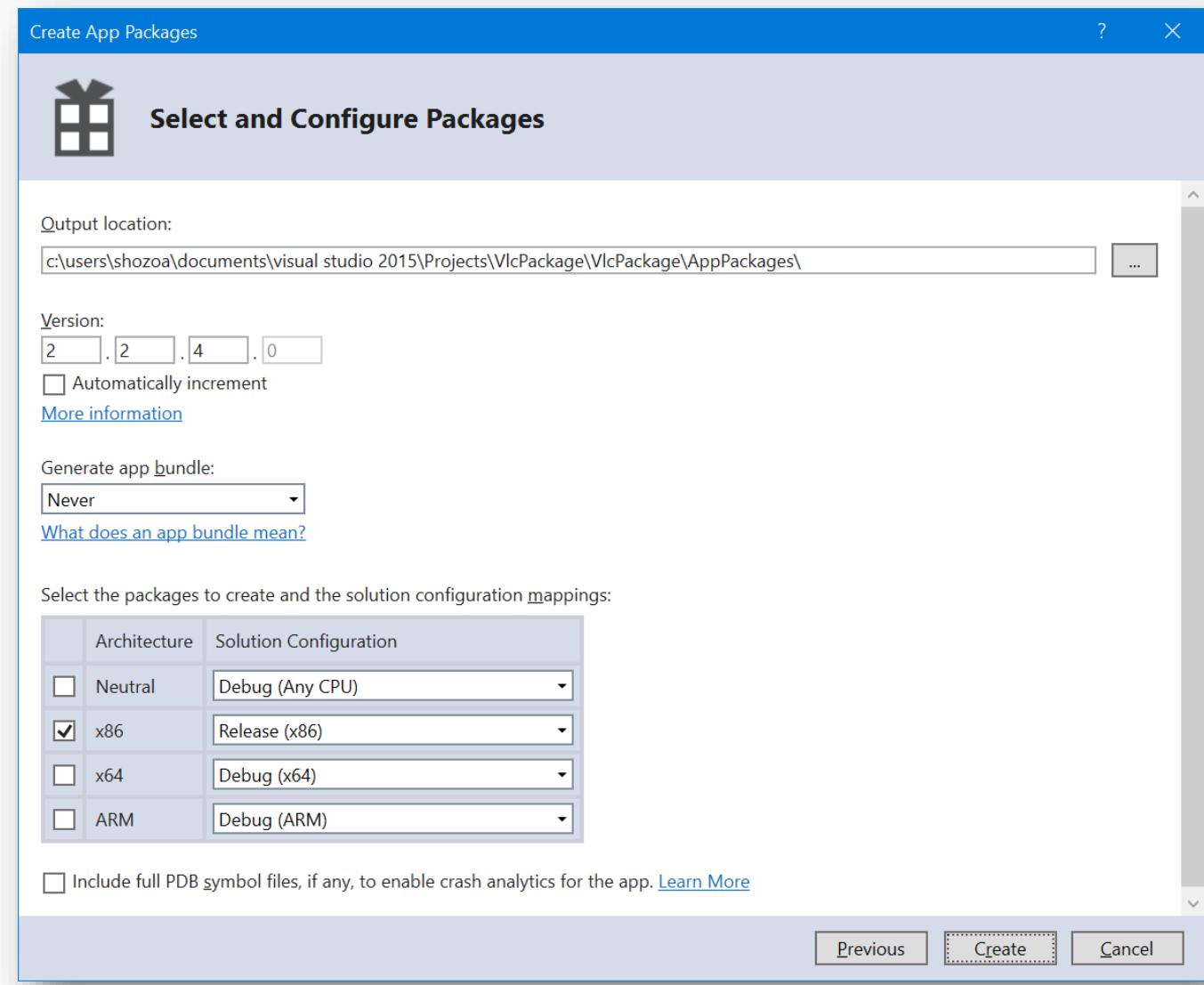
Step 16: Create Appx package (3 of 4)

- Select following items:

Version

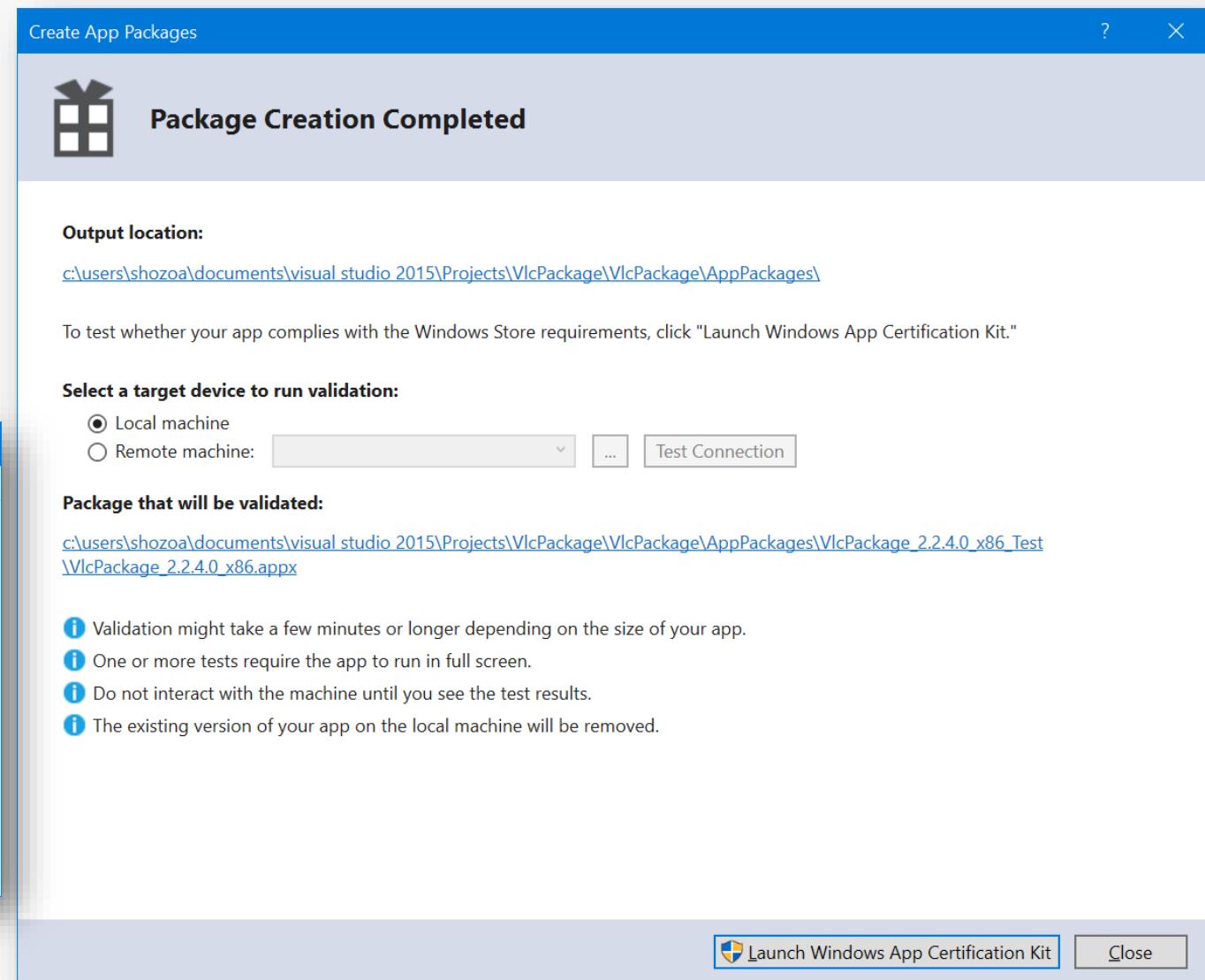
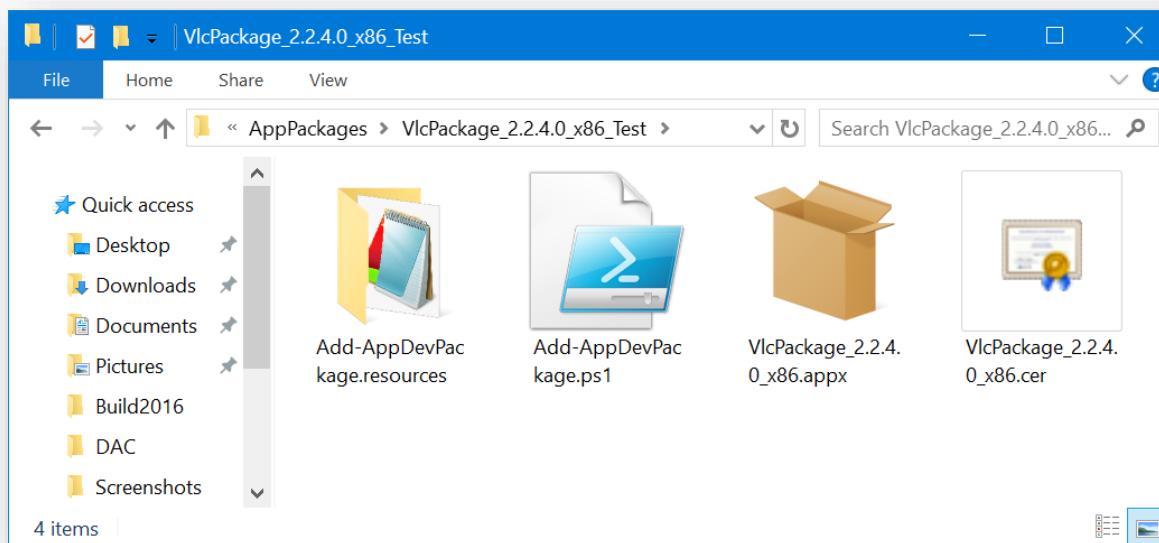
App bundle

Solution Configuration



Step 17: Created Appx package (4 of 4)

- Include certificate and install script file and appx package in output folder



Step 18: Possible Error: Occur error of VLC

App manifest references the square 310x310 logo image 'Assets\appLargeTile.scale-400.png' which is larger than the maximum image file size. It must be no larger than 204800 bytes.

Please Note: Please Delete xxxxxx.scale-400.png, then
create appx package

Summary:

Learned how to create Appx package by using Visual Studio

- Visual Studio build system creates automatic artifacts, such as PRI resources, etc.
- Visual Studio checks package.appxmanifest and Asset's limitation
- This project cannot be used for debug purposes

