DisplayLink Corporate Install Guide

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2 Introduction

This document is intended to give a Windows Administrator a brief overview of Deploying DisplayLink's Corporate Installer across a Windows Active Directory Domain.

DisplayLink provide the Microsoft Installer files, or a driver package to allow remote deployment of DisplayLink software. The various deployment options are described in this document.

3 Target Audience

Any IT Professional who is familiar with Windows Server, Group Policy, and deploying software company-wide via Group Policy Software Installation (GPSI) or via SCCM (System Center Configuration Manager).

4 Corporate Download

DisplayLink corporate install images can be downloaded from:

http://www.displaylink.com/corporateinstall (signup required)

5 Deploying the DisplayLink Software

5.1 Considerations

DisplayLink software can be deployed by either pushing the MSI files to selected computers on the corporate network or by adding the DisplayLink software to the Windows driver store, so it is installed on when a DisplayLink is first connected to the PC. The pros and cons of these mechanisms are discussed below.

5.1.1 Deploying using MSI files

Installing using the MSI files will completely install DisplayLink software, ready to be used when the DisplayLink device is connected.

Pros:

- Allows deployment to PCs where users do not have Administrator privileges
- Allows remote management of software install, upgrade and uninstall

Cons:

- Could be deployed to PCs that are not connected to DisplayLink devices. However DisplayLink software will run in "minimal system impact" until a DisplayLink device is connected
- MSI installations cannot be upgraded using Windows Update

5.1.2 Deploying using a driver package

Deploying using the driver package will place the DisplayLink software in the Windows driver store, ready to be installed when the DisplayLink device is connected.

Pros:

- DisplayLink software is only installed once a DisplayLink device is connected to a PC.
- Enables Windows to find the DisplayLink driver even when not connected to the Internet
- Can be used alongside Windows Update to update drivers.

Cons:

- Requires the user to have Administrator privileges to complete the DisplayLink software installation.

5.2 System Compatibility check

From software version 7.5, DisplayLink's Setup.exe will run a compatibility check before installation. **This will make no changes to your system** and only checks for potential issues. The areas checked are:

- Primary Graphics card drivers are installed and up to date
- USB 3.0 host controller drivers are up to date
- No incompatible software drivers installed

The compatibility check also checks the system during runtime, eg when a DisplayLink device is connected.

The MSI files will not run the check during installation, so no messages will be shown to the end user. Runtime checks are also disabled if installing from the MSI files by setting the registry key HKLM\SOFTWARE\DisplayLink\Core\DisableCompatibilityChecks to "yes".

A stand alone check application is provided by DisplayLink. This allows an IT manager to remotely run the compatibility check and obtain a log file containing any failures. The failures can then be addressed before the MSI files are deployed to the remote system. For more information, please refer to this article:

http://kb.displaylink.com/365

6 Deploying the DisplayLink Software using the MSI files

Important Note: If DisplayLink software has been deployed through MSI files, it cannot be updated through Windows Update. DisplayLink strongly recommends disabling Windows Update on computers where DisplayLink software has been deployed using the MSI files.

6.1 About the DisplayLink MSI files

Due to the nature of our Software, you'll receive a Zip file with four MSIs inside; *DisplayLinkCore.msi* and *Setup.msi* both in 32-bits and 64-bits. DisplayLink software is more than a USB driver. A virtual graphics driver and DisplayLink pixel encoder also need to be installed for DisplayLink devices to correctly function.

6.1.1 DisplayLinkCore.msi

The DisplayLink Core software provides core DisplayLink functionality. It installs the DisplayLink USB Graphics Card Driver, as well as the basic DisplayLink GUI in the system tray.

6.1.2 Setup.msi

The Setup file provides additional functionality, such as the ability to recognise hardware button presses on Docking Stations. Think of it like installing software on a freshly-installed laptop that enables the Function key buttons.

6.1.3 Installation requirements

Both files are required for proper functionality of the DisplayLink software, and must be installed in a specific order; **Core first, then Setup**.

To achieve this, add the Core Software to GPSI first, and then add the Setup.msi afterwards. As GPSI installs MSIs based on Timestamp, it should install the MSIs in the correct order.

In case of using SCCM, make the installation of the Setup package dependent on the installation of the Core package, this way the Core package will always be installed first.

Installing just the Core software is not supported by DisplayLink and may cause undesirable behaviour on an end-user's PC.

Note: It is not possible to install these MSI files just by double clicking them to install. If User Access Control (UAC) is enabled on the tested machine during an installation, the audio and Ethernet drivers will silently fail to install due to an "access denied" error (even if a user is prompted for elevation).

If testing without using GPO, start the installation from command line with administrative privileges. The following commands can be used to install the MSI packages using msiexec on the command line:

```
msiexec /i %SETUP%\DisplayLinkCore.msi /norestart /passive

msiexec /i %SETUP%\Setup.msi /norestart /passive
```

6.2 Setting up the GPOs and File Shares

At the time of writing, our MSIs are available in two flavours: 32-bit and 64-bit. If you have both 32-bit and 64-bit Operating Systems in your organisation, you'll need to create two GPOs; one for 32-bit and one for 64-bit. For reference, the 32-bit installer will not install on a 64-bit OS.

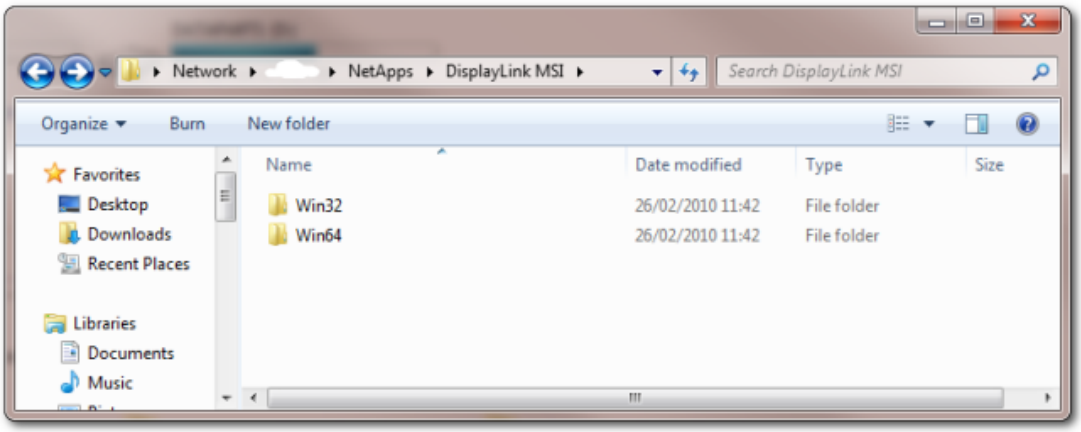
As this guide assumes knowledge of Group Policy, this section will be brief.

6.2.1 Setting up the File Shares

1. Download the DisplayLink Corporate install files from here: http://www.displaylink.com/corporateinstall/

2. Create or use an existing file share for deploying software and drivers. The share must be accessible by the System user in order for GPSI to install the software on the target PCs
3. Extract the .zip that was downloaded into a DisplayLink MSI directory on your network file share.

    a. Your extracted files should look like this:



6.2.2 Creating the 32-bit GPO

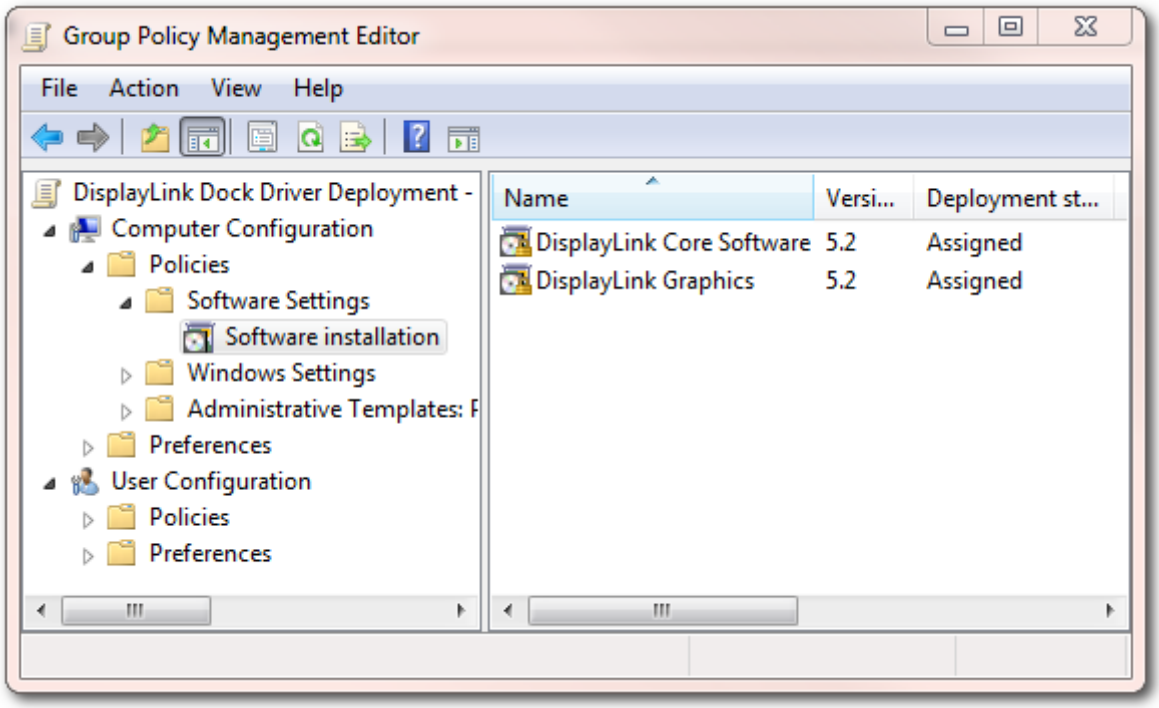
1. Create a new Group Policy Object (GPO) in the Group Policy Management Console (GPMC)

    a. In this guide, we'll be calling it *DisplayLink Device Driver Deployment - 32-bit*.

    b. You may wish to call it something else, particularly if you're only interested in deploying the DisplayLink driver, and not extra drivers, such as Ethernet.

2. Put the 32-bit *DisplayLinkCore.msi* and *Setup.msi* onto a network file share.

3. Edit the GPO you just created, and go to:
   Computer Configuration > Policies > Software Settings > Software installation



4. Right click > New > Package...

   a. Add and Assign *DisplayLinkCore.msi*

   b. Add and Assign *Setup.msi*

6.2.3 Creating the 64-bit GPO

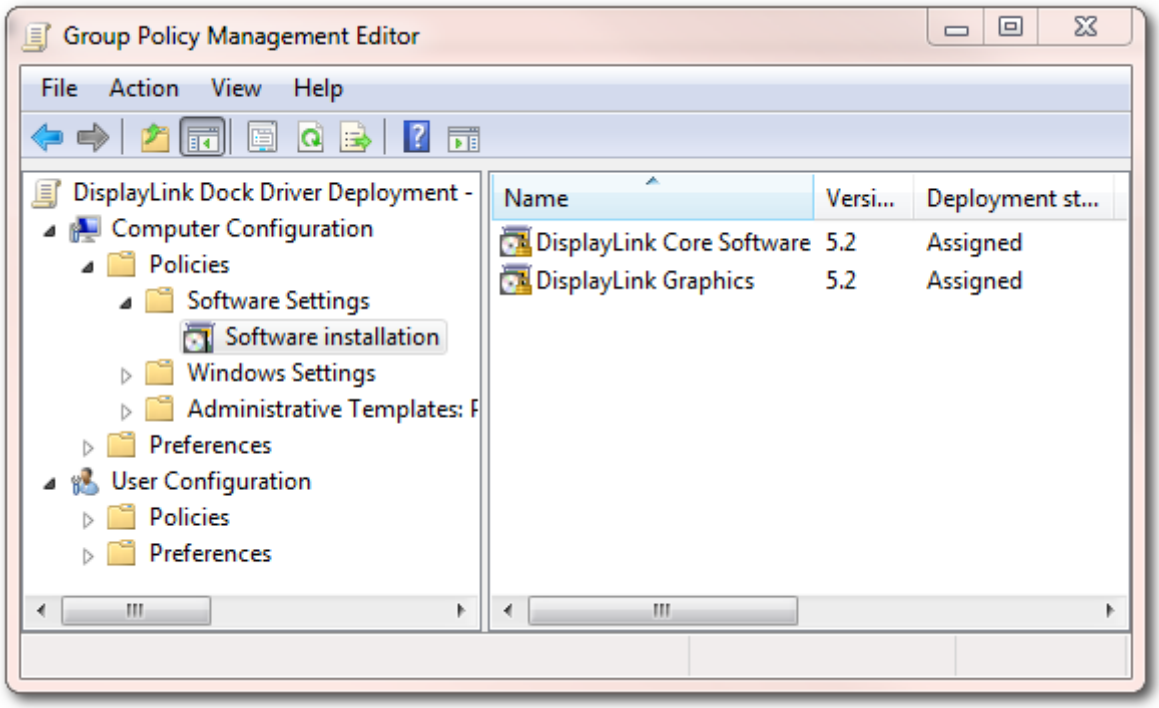
1. Create a new Group Policy Object (GPO) in the Group Policy Management Console (GPMC)

   a. In this guide, we'll be calling it *DisplayLink Device Driver Deployment - 64-bit*.

   b. You may wish to call it something else, particularly if you're only interested in deploying the DisplayLink driver, and not extra drivers, such as Ethernet.

2. Put the 64-bit *DisplayLinkCore.msi* and *Setup.msi* onto a network file share.

3. Edit the GPO you just created, and go to:
   Computer Configuration > Policies > Software Settings > Software installation



4. Right click > New > Package...

   a. Add and Assign *DisplayLinkCore.msi*

   b. Add and Assign *Setup.msi*

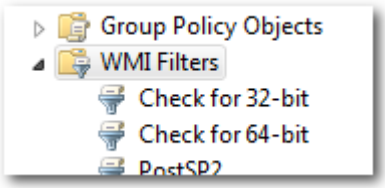
6.3 Targeting 32-bit and 64-bit Operating Systems

To ensure that only the correct MSI is installed on the correct architecture, it's necessary to utilise Group Policy's WMI Filtering to target the correct OS architecture.

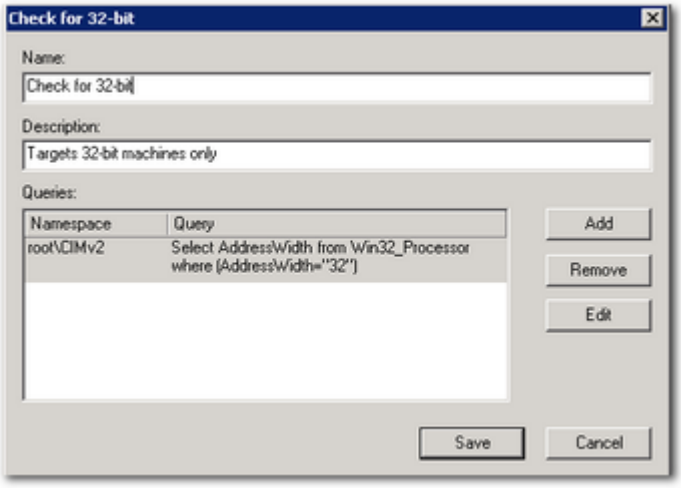
6.3.1 Targeting only 32-bit Operating Systems

6.3.1.1 Setting up the WMI Filter

- Open up the Group Policy Management Console (GPMC)
- Locate *WMI Filters* in the left panel



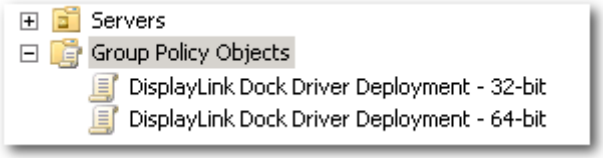
- Right click on WMI Filters and choose “New…”
- Give the WMI Filter an appropriate name and description. For example, “Check for 32-bit”
- Click Add, to add a new query
- Add the following Query:
  `Select AddressWidth from Win32_Processor where (AddressWidth="32")`



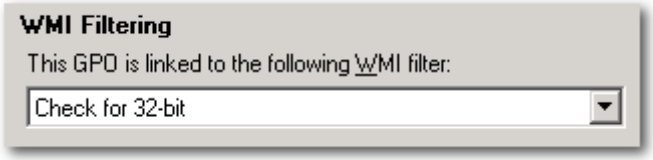
- Click OK, then Save

6.3.1.2 Applying the WMI Filter to the Group Policy Object

- Locate your 32-bit GPO in GPMC and click on it



- You should now see the GPO appear in the Right-hand pane
- Under the Scope Tab, click on the Dropdown box underneath “WMI Filtering” and choose the 32-bit WMI filter



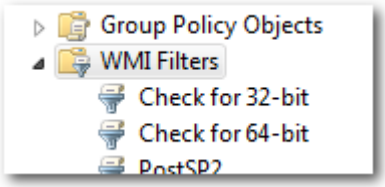
- This GPO will now only be applied to 32-bit Operating Systems

6.3.2 Targeting only 64-bit Operating Systems

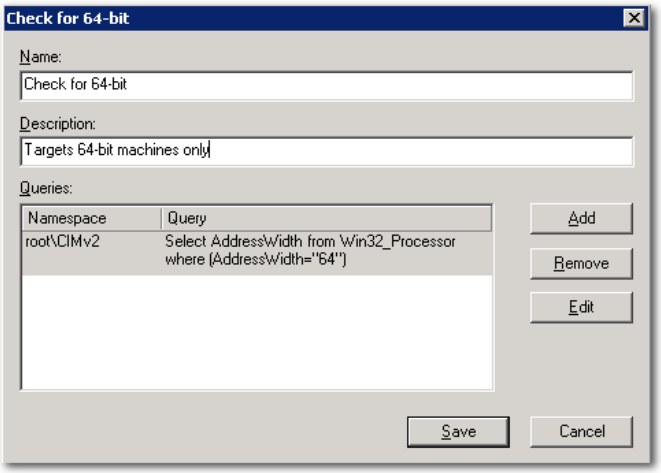
6.3.2.1 Setting up the WMI Filter

- Open up the Group Policy Management Console (GPMC)

- Locate *WMI Filters*



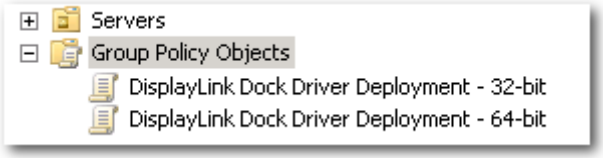
- Right click on *WMI Filters* and choose “New…”
- Give the WMI Filter an appropriate name and description. For example, “Check for 64-bit”
- Click Add, to add a new query
- Add the following Query:
  Select AddressWidth from Win32_Processor where (AddressWidth="64")



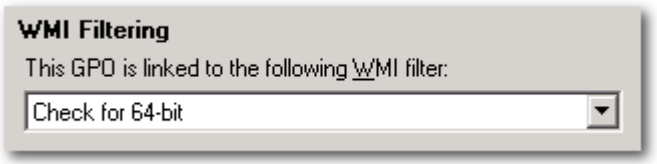
- Click OK, then Save

6.3.2.2 Applying the WMI Filter to the Group Policy Object

- Locate your 64-bit GPO in GPMC and click on it



- You should now see the GPO appear in the Right-hand pane
- Under the Scope Tab, click on the Dropdown box underneath “WMI Filtering” and choose the 64-bit WMI filter



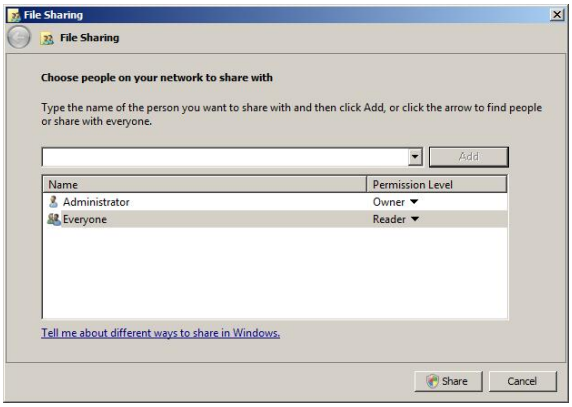
- This GPO will now only be applied to 64-bit Operating Systems

6.4 Setting up SCCM

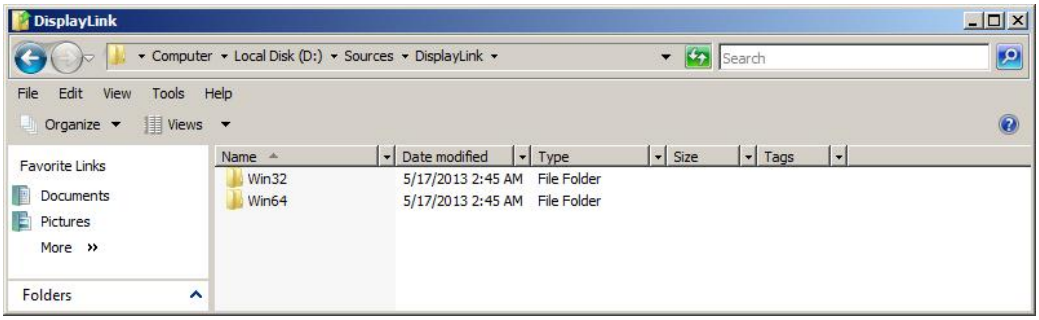
This section will only explain how to deploy the DisplayLink Software using SCCM. A requirement for this is a working Active Directory and SCCM environment with the Configuration Manager Client installed, or being pushed, to the target machines.

6.4.1 Setting up the File Share

1. Download the DisplayLink Corporate install files from here: http://www.displaylink.com/corporateinstall/
2. Create or use an existing file share for deploying software and drivers. The share must be accessible by the “Everyone” group in order for SCCM to install the software on the target PCs.

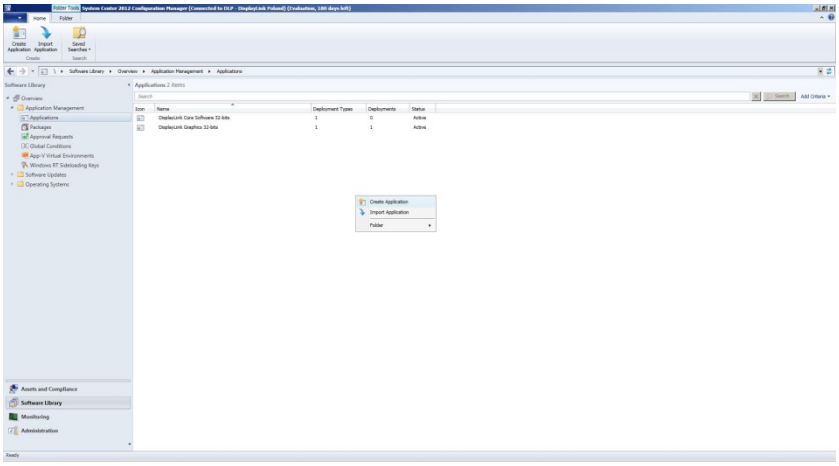


3. Extract the .zip that was downloaded into a DisplayLink MSI directory on your network file share. Your extracted files should look like this:

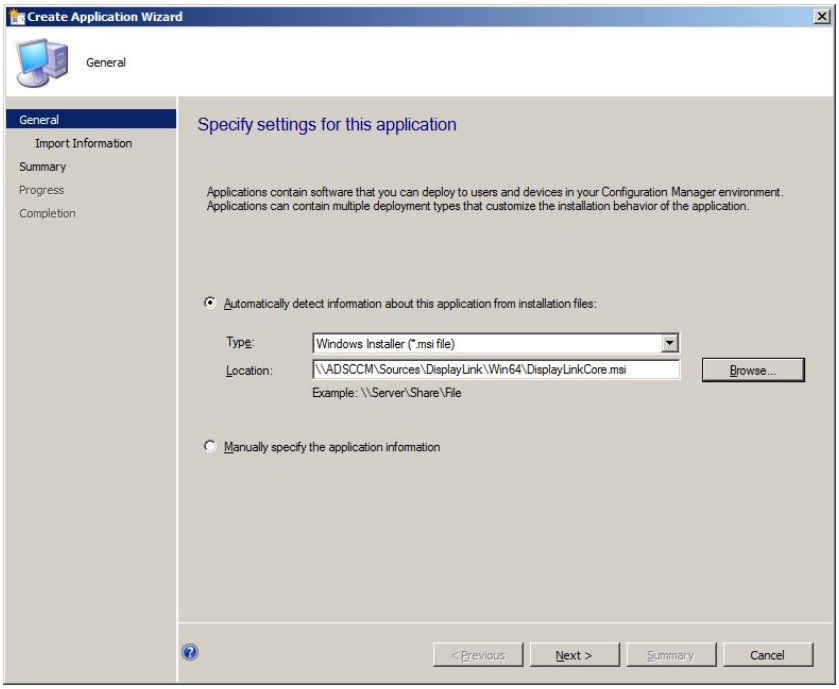


6.4.2 Creating the installation packages

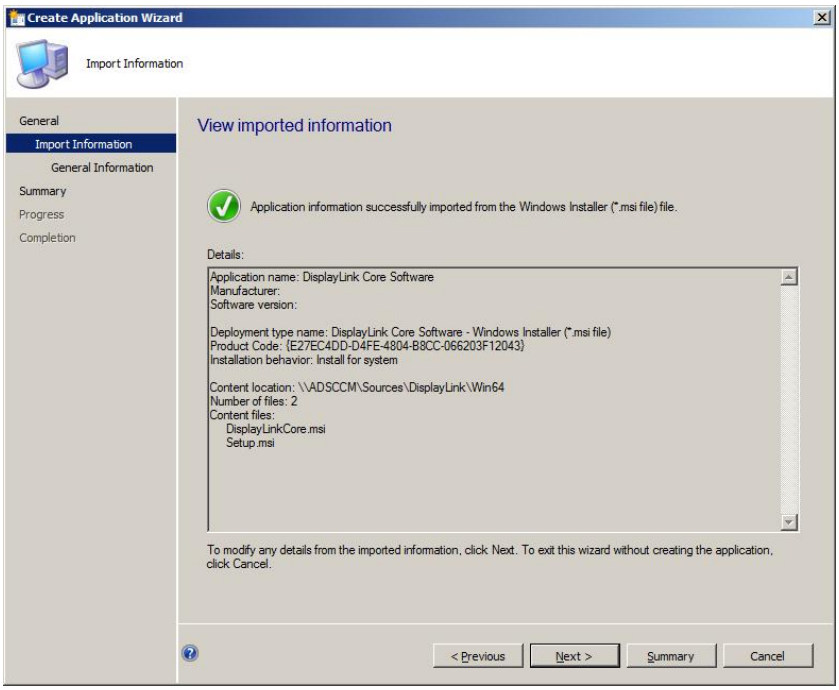
1. In Software Library \ Overview \ Application Management \ Applications, create a new application:



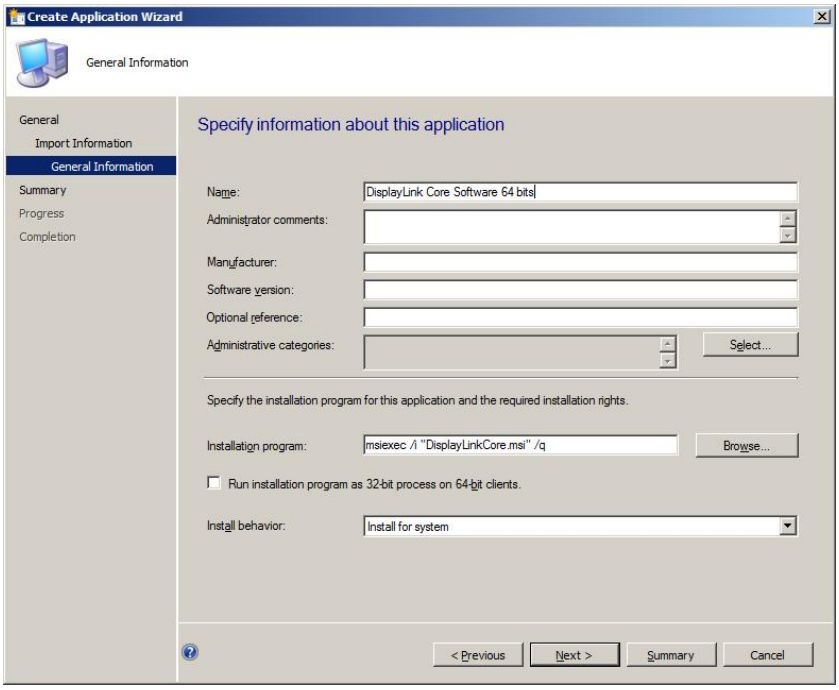
2. Select “Automatically detect…” and “Type” as “Windows Installer”. Browse to the network share used in 4.4.1 and select the “DisplayLinkCore.msi” file.
3. Process for 32-bits and 64-bits is the same, making sure that the versions don’t get mixed up. For 32-bits Core, use 32-bits Setup and vice-versa.



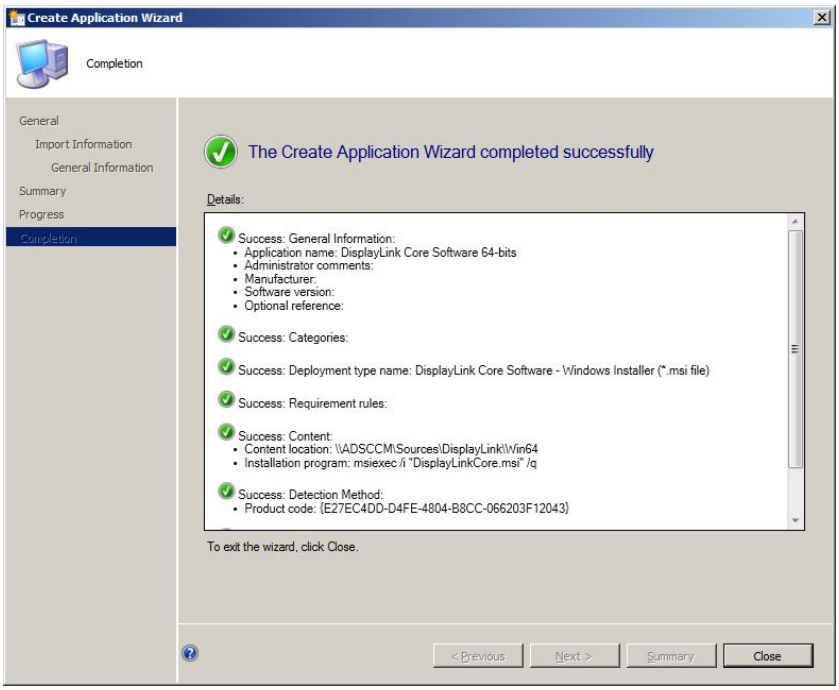
4. If everything is correct, the following screen should appear:



5. Give the application a name, in this case the 64-bits version is being created. The name given here will appear in the list of applications in SCCM.

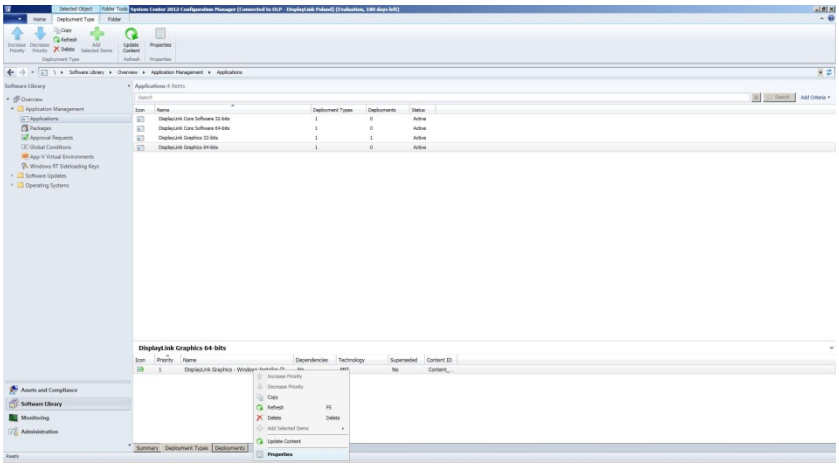


6. When the creation of the application is complete, the following screen appears. The steps need to be repeated for the DisplayLink Setup MSI file, making sure not to mix up the different bit versions of the MSI packages



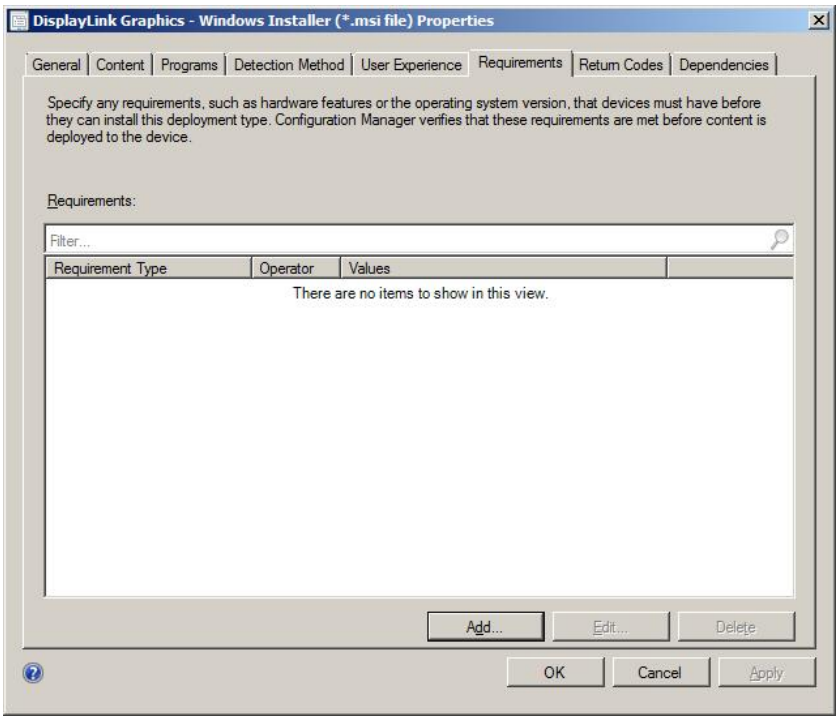
6.4.3 Setting the deployment type

1. In Software Library \ Overview \ Application Management \ Applications select the previously created application and select the “Deployments Type” tab in the lower screen. Right click on “Deployment Type” and select “Properties”.

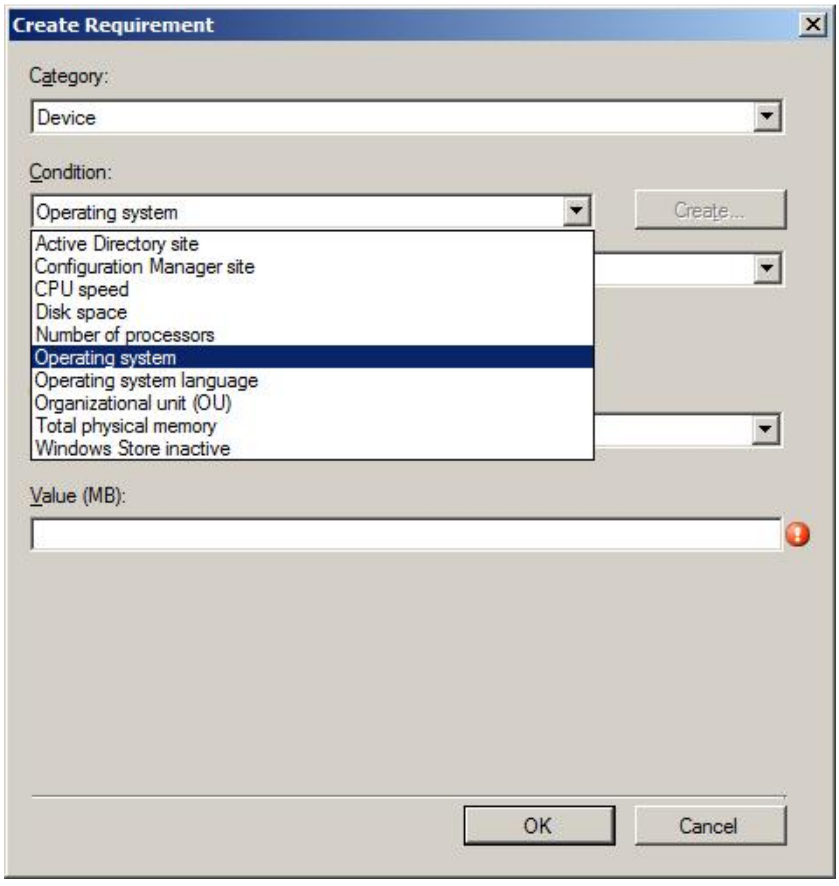


2. In the “Requirements” tab, add a new requirement. DisplayLink software comes in 32-bits and 64-bits versions. To prevent installing the wrong version, the OS requirements needed to be declared. This can be done with a bit version rule, but it is recommended to do it on OS version rule, so non

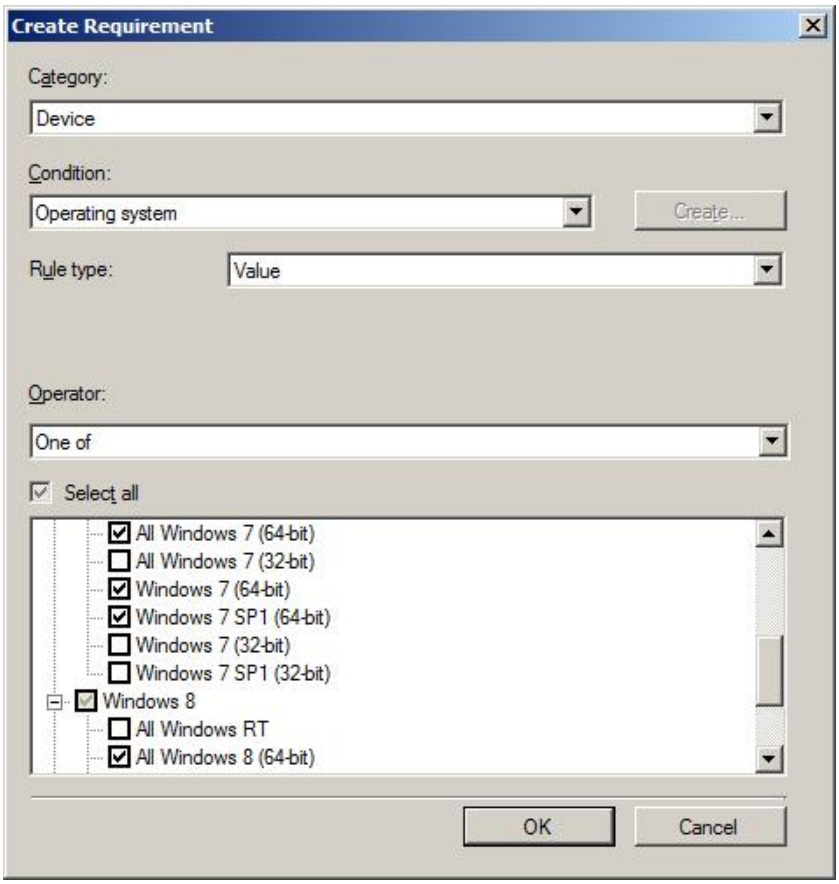
supported OS versions can be excluded.



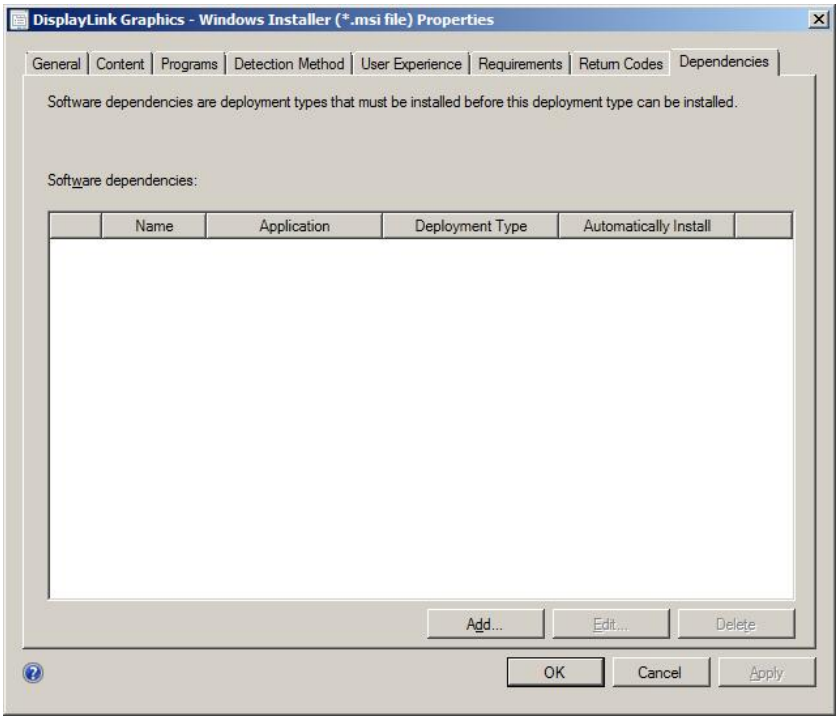
3. Select the “Device” category and the “Operating system” condition. The default operator (One of) doesn’t require any changes



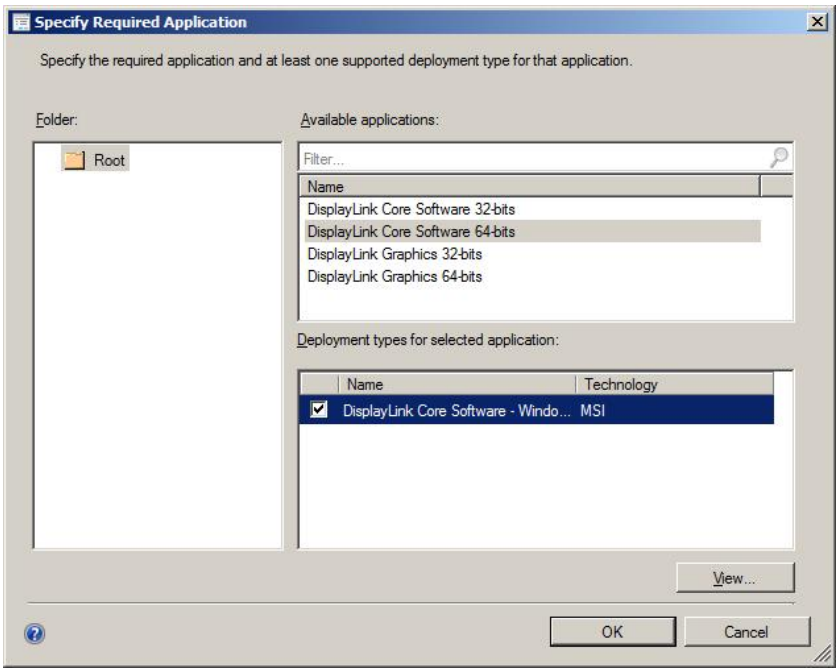
4. Select the OS Version(s) that are targeted. In this case all the supported 64-bits Windows versions.



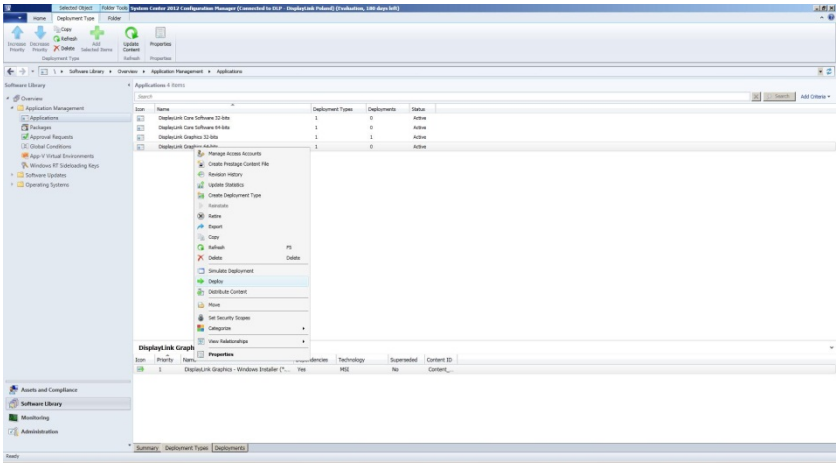
5. In the tab" Dependencies", add a new dependency. As stated before, the Setup cannot be installed without the Core package. The required Core package needs to be added here.



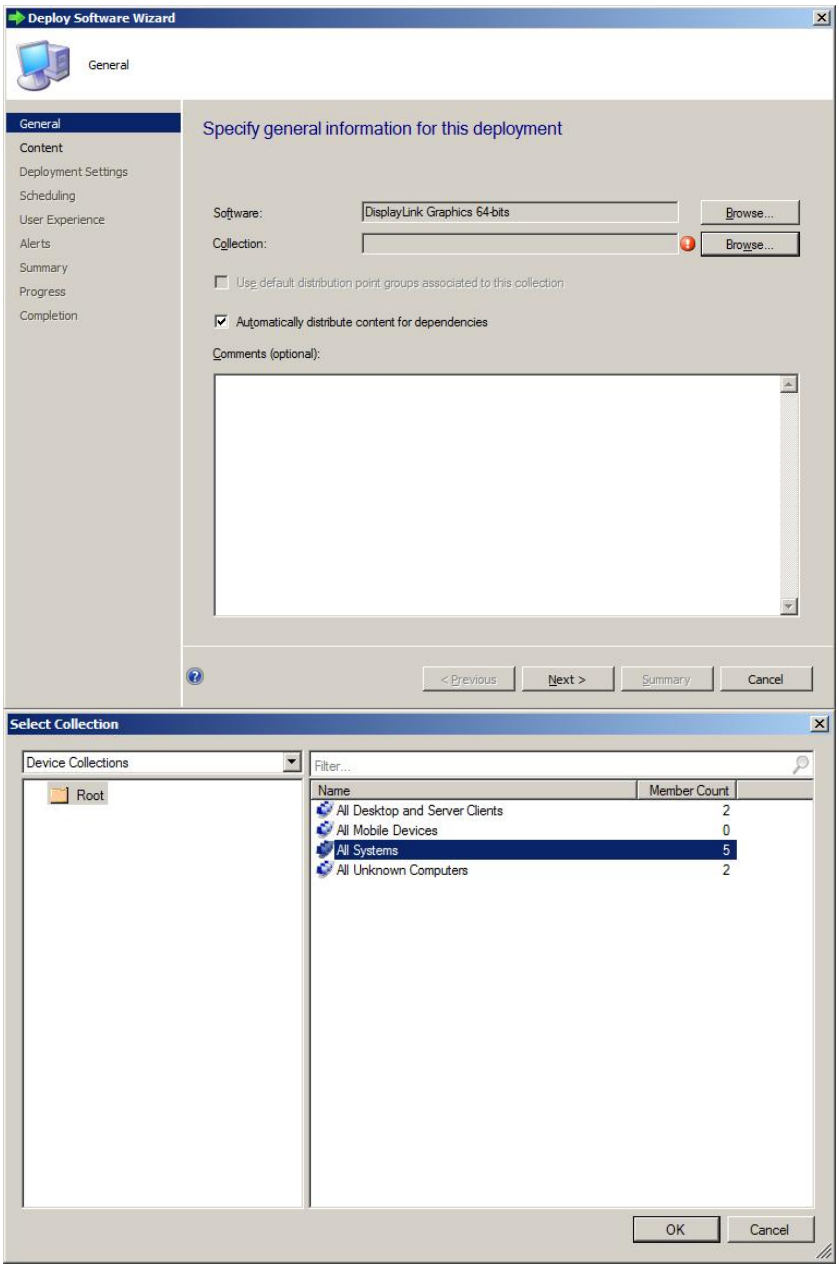
6. Browse in Root to the matching Core Installation application.



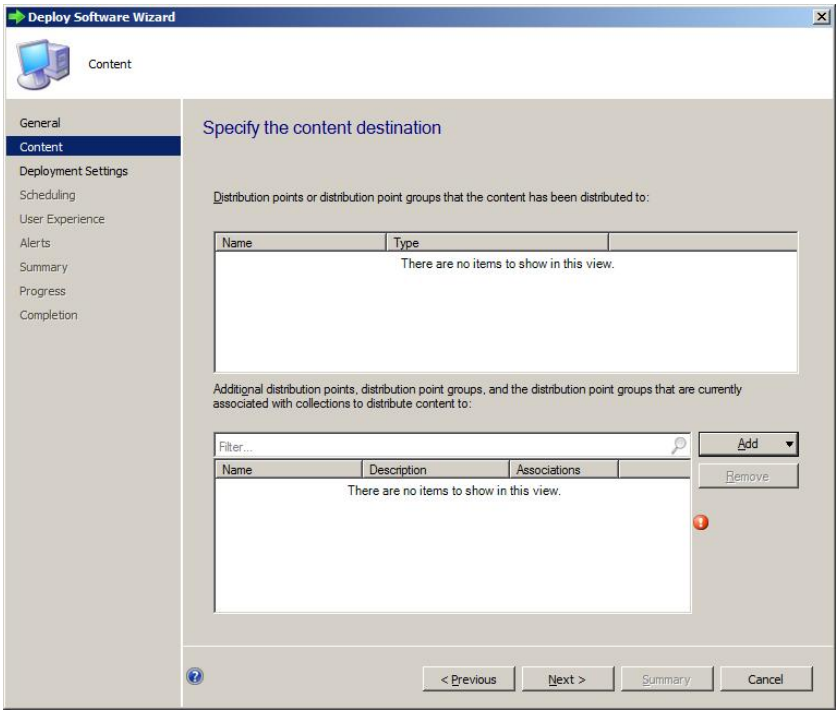
7. After setting the requirements and the dependencies, the application is ready to be deployed.



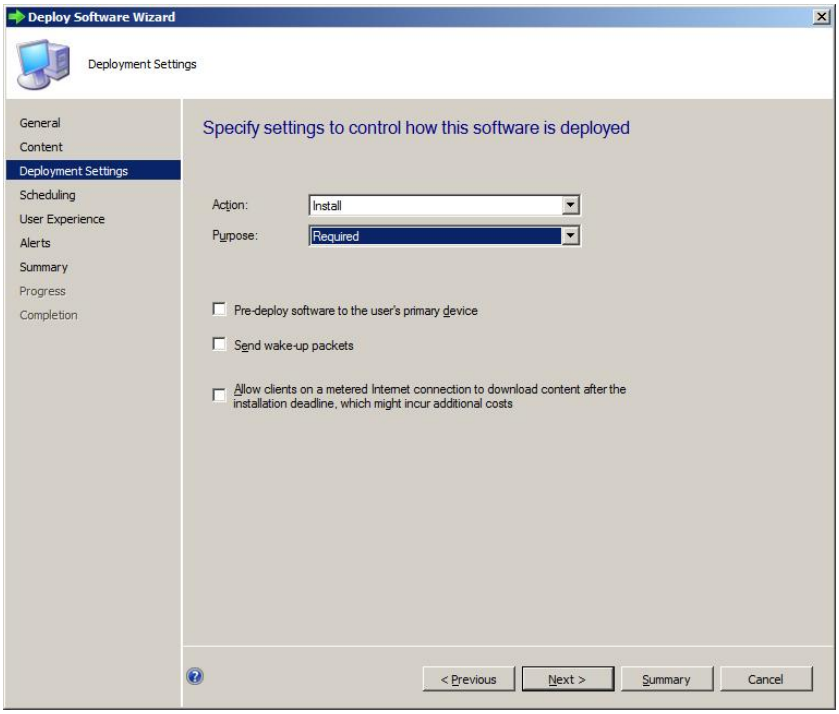
8. Browse to the required Collection, in this case “All Systems”, since we want the DisplayLink software to be deployed to every system.


Deploy Software Wizard
General
General
Content
Deployment Settings
Scheduling
User Experience
Alerts
Summary
Progress
Completion
Specify general information for this deployment
Software:
DisplayLink Graphics 64-bits
Browse...
Collection:
Browse...
Use default distribution point groups associated to this collection
Automatically distribute content for dependencies
Comments (optional):
< Previous
Next >
Summary
Cancel
Select Collection
Device Collections
Root
Filter...
Name
Member Count
All Desktop and Server Clients 2
All Mobile Devices 0
All Systems 5
All Unknown Computers 2
OK
Cancel

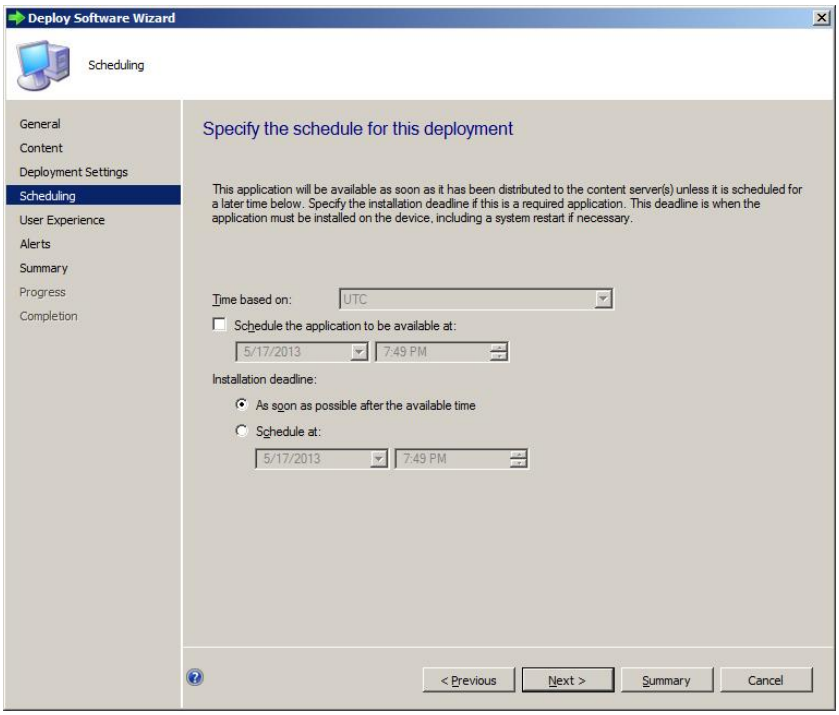
9. The software packages need to be distributed to Distribution Points or Distribution Point Groups, depending on the hierarchy of the infrastructure.



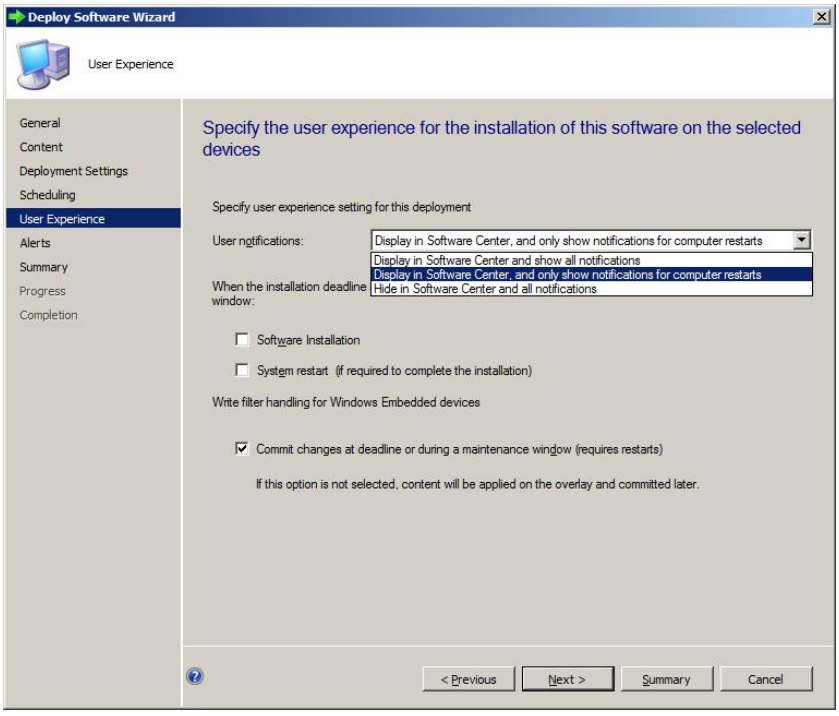
10. Next the action needs to be selected; Installation is the purpose of this deployment. Optional the purposes can be selected, depending on the policies.



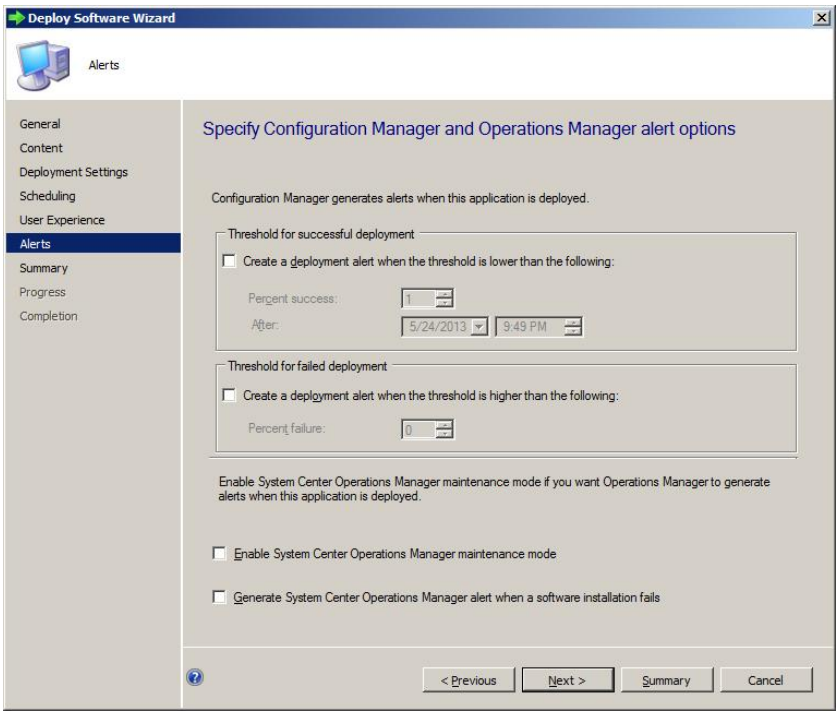
11. If you do not want to deploy the software immediately, a schedule can be selected.



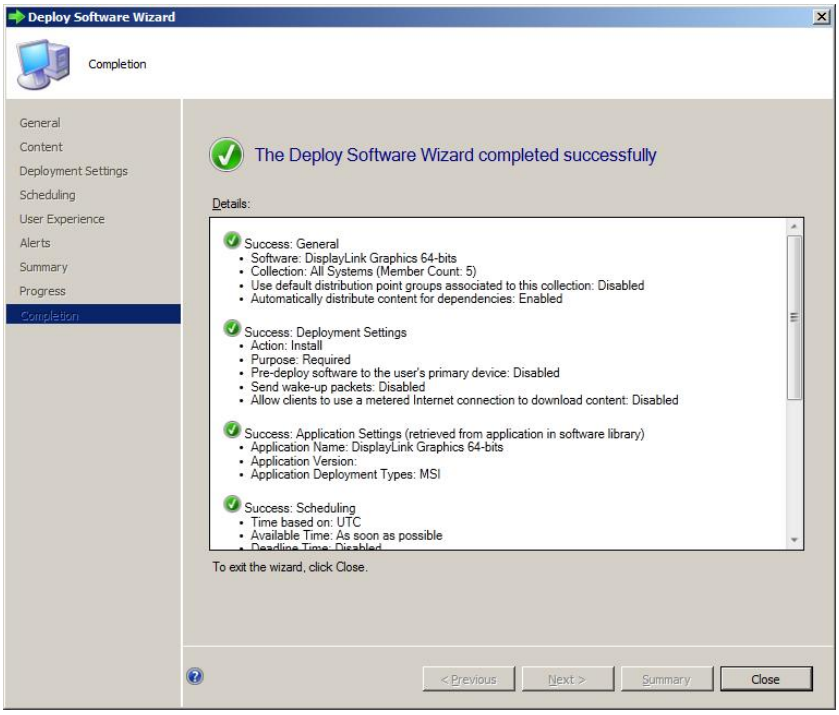
12. When deploying DisplayLink software it is recommended to show notifications. This is because Installing DisplayLink software can cause screen flashing to occur as the graphics drivers are installed.



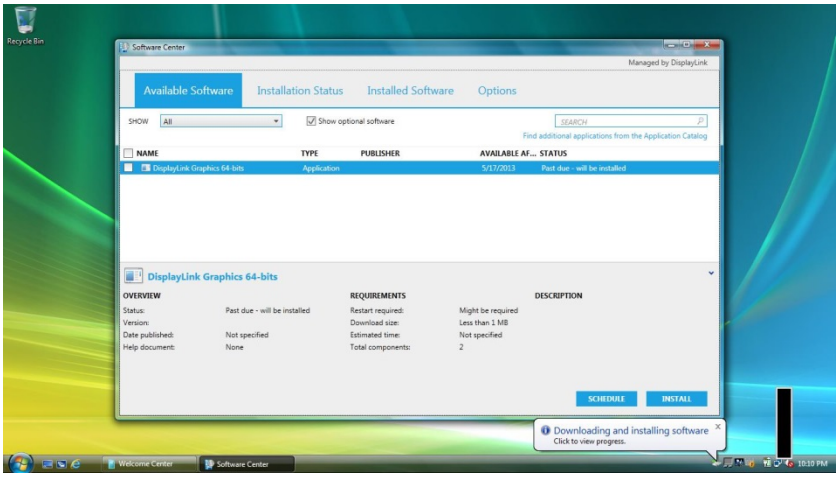
13. SCCM can generate alerts if required:



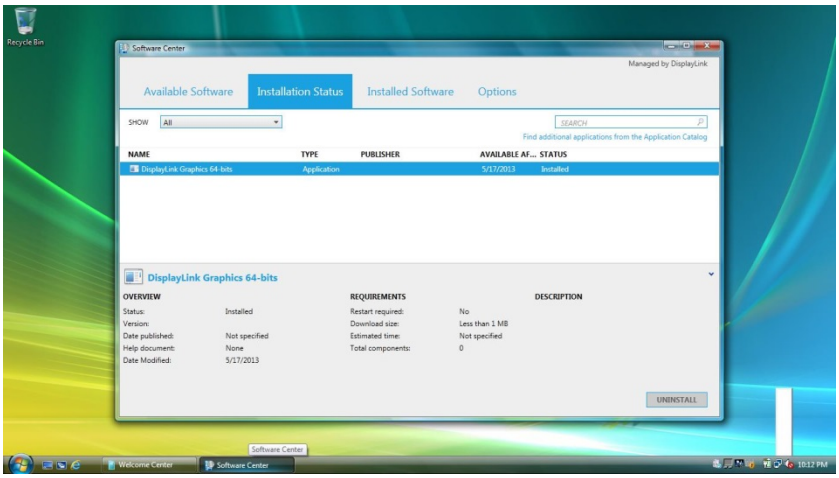
14. SCCM will validate all the settings and when everything is correct, the software will be deployed.



15. On the target systems the DisplayLink software should appear in the Configuration Manager Client, installing automatically, depending on the settings of the deployment.



16. Configuration Manager Client will also display the status of the installation.



6.5 Testing the DisplayLink software deployment

6.5.1 Testing

It's best to test the GPO works before rolling it out company-wide:

1. Make a Test OU and put a few Test or Lab PCs in the OU. Call it something like "DPinst Test Computers"
2. Apply the DPinst GPO to the Test Computer OU
3. If your AD DC infrastructure is large, you may need to wait a while for the new GPO to propagate around.
4. On the test computers, add a domain user as a Limited Account on the Test PCs
5. Run: gpupdate on the Test PCs
6. Reboot the Test PCs
7. Log in as the limited user and plug in the DisplayLink device. If the Drivers install successfully, everything went OK. If the drivers didn't install, wait a while and reboot again. It may be that Group Policy wasn't refreshed properly on the Test PC, or the GPO hasn't propagated fully yet. It can sometimes take two or three reboots to pick up the new Group Policy settings.

8. Once everything works as expected, it should then be safe to deploy the solution onto the corporate network.

6.5.2 Rolling out the Driver

To roll out the driver, simply link the GPO to which Computer OU you want to deploy the driver to.

6.5.3 After installation

In order for the DisplayLink-enabled hardware to function properly, a subsequent reboot may be required after GPSI has installed the DisplayLink software on the end-users machine. This is normal, as installing a graphics driver under Windows usually requires a reboot, post-installation.

6.6 Uninstalling the MSI installed Drivers

Note: These steps are only supported from v6.1 M1 onwards. Releases before this date cannot be silently uninstalled.

To uninstall the DisplayLink software, msiexec can be run in quiet mode. The following commands should be run in the following order:

To uninstall the product:

```
start /wait msiexec /qn /x \\path\to\Setup.msi DL_PACKAGE_ONLY=Yes
REBOOT=ReallySuppress
```

To uninstall the DisplayLink Core software:

```
start /wait msiexec /qn /x \\path\to\DisplayLinkCore.msi REBOOT=ReallySuppress
```

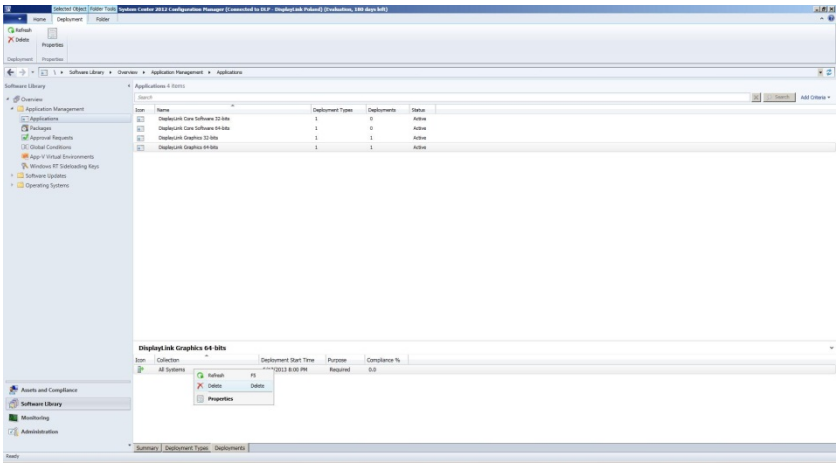
If the option "REBOOT=ReallySuppress" is not used, the system will automatically reboot without warning after the uninstall. This is probably not desired behaviour, therefore it is suggested this option is set, and the PC rebooted by the user later.

Note that it is not possible to uninstall the Core if there are other customer product packages installed.

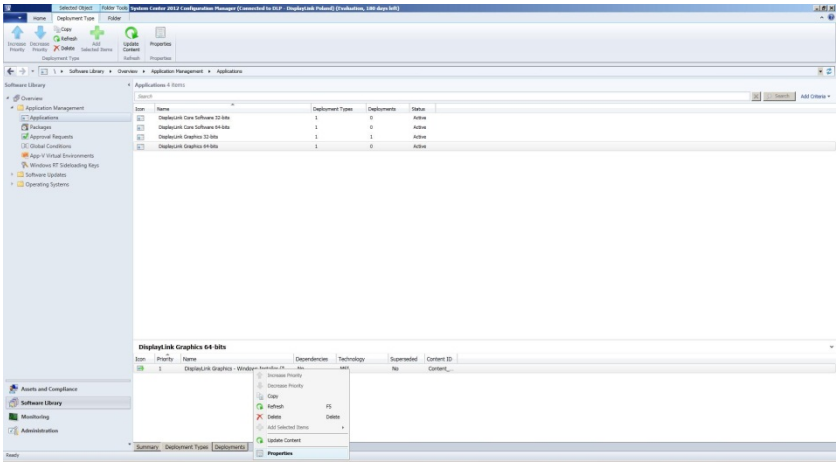
To remove the DisplayLink software from SCCM:

1. In Software Library \ Overview \ Application Management \ Applications select the application that needs to be uninstalled. Make sure that Graphics application is selected. In the tab Deployments,

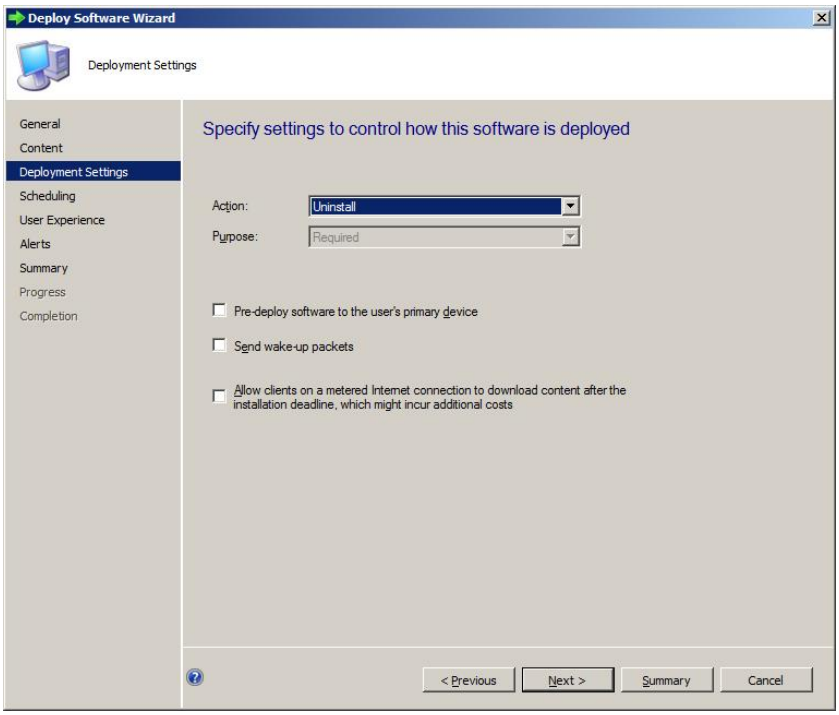
delete the current deployment.



2. In tab Deployment types select properties.



3. Repeat the steps as above, only changing the Deployment Settings to Uninstall.



7 Deploying the Driver Package to the Windows driver store

To deploy the driver package, it needs to be added to the Windows driver store. This can be done using the Windows command pnputil. More information on pnputil can be found here:

http://msdn.microsoft.com/en-gb/library/windows/hardware/ff550419(v=vs.85).aspx

To add the DisplayLink driver to the Windows driver store:

1. Extract the contents of the driver package
2. Open a Command Prompt window (Run as administrator).
3. Change directory to the extracted driver package files and execute the command:

```
pnputil.exe –i –a DisplayLinkUsb.inf
```

The “-i” option is needed to ensure the DisplayLink software is installed after the USB driver is installed.

This should show that the Driver package has been added successfully.

8 Windows PE support

DisplayLink software is not supported and cannot be installed on Windows PE. However it is possible to install the Ethernet driver under Windows PE. The Ethernet driver can be found in:

```
C:\Program Files\DisplayLink Core Software
```

If using V7.1 or older software/firmware on the device, then the Ethernet driver from this directory will be required:

```
C:\Program Files\DisplayLink Core Software\CdcEcmDriver
```

For V7.2 or later, the Ethernet driver from this directory will be required:

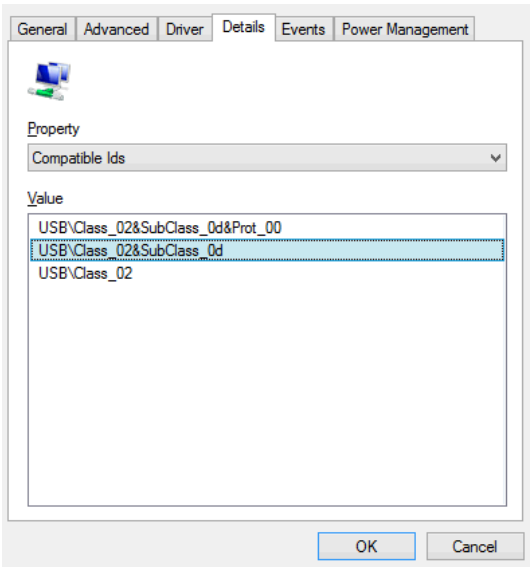
```
C:\Program Files\DisplayLink Core Software\CdcNcmDriver
```

This driver can be installed under Windows PE with the command:

```
drvload dlcdcecm.inf
```

8.1 Installing both Ethernet driver versions

It is possible to identify the Ethernet driver required by the device by looking at the SubClass ID of the Ethernet adapter in device manager:



If the device requires the ECM driver, this will be shown as “USB\Class_02&SubClass_06”. If the device requires the NCM driver, this will be shown as “USB\Class_02&SubClass_0d”. It should be possible to create a script to load the appropriate driver based on the SubClass ID.

9 WIFI / USB LAN switching

It may be a requirement to disable the WIFI of a laptop when connected to the USB dock, and using the corporate Ethernet connection on the USB docking station. This prevents end users creating a wireless AP to bridge to the corporate LAN, providing a potential security risk.

DisplayLink software does not have the configuration to disable WIFI when connected to the USB dock LAN. However this is supported by 3rd party applications. For example wirelessautoswitch has added support for the DisplayLink Ethernet connection in docks. This can be downloaded from:

http://www.wirelessautoswitch.com/