Dell Hybrid Client

Version 1.x Conversion and Upgrade Guide

Notes, cautions, and warnings

(i) **NOTE:** A NOTE indicates important information that helps you make better use of your product.

⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

Introduction

Dell Hybrid Client is a desktop solution by Dell that follows the Software-as-a-Service (SaaS) model of software delivery. It provides a hybrid operating environment that enables you to access virtual, cloud, or local applications and resources seamlessly. It encompasses the cloud and storage aggregation for maintaining security and simplicity.

You must use a management software to configure, operate, and update devices that are powered by Dell Hybrid Client, thereby eliminating the need for IT support to visit the physical devices. You can manage the devices by using Wyse Management Suite Pro. Wyse Management Suite offers process automation and helps lower costs for large deployments of devices that are powered by Dell Hybrid Client. Using secure HTTPS-based communication and Active Directory authentication for role-based administration, Wyse Management Suite keeps your devices up to date. The Wyse Management Suite mobile application enables administrators to view critical alerts, notifications on the dashboard, and send real-time command.

This guide contains instructions to convert the devices running Windows 10 IoT Enterprise LTSB, Windows 10 IoT Enterprise LTSC, ThinLinux 2.x, and ThinOS 8.6 to Dell Hybrid Client using Wyse Management Suite Pro 3.x or later. This guide also provides information to upgrade the devices running Ubuntu 18.04 or 20.04 to Dell Hybrid Client using Wyse Management Suite Pro 3.x or later. The target audience for this guide is enterprise customers with administrator privileges.

Supported platforms for Dell Hybrid Client conversion

1. Dell platforms with Ubuntu 20.04/18.04 and DCA-Enabler installed can be converted to Dell Hybrid Client 1.6. For more information, refer to Convert Dell Generic Client to Dell Hybrid Client.
2. The below platforms with ThinOS 8.x or ThinLinux can be converted to Dell Hybrid Client 1.1.01. For more information, refer to Dell Wyse 5070 Conversion.
   - Wyse 5070 - 16 GB eMMC and 4 GB RAM.
   - Wyse 5070 Extended - 16 GB eMMC and 4 GB RAM.
3. The below platforms with Windows 10 can be converted to Dell Hybrid Client 1.6. For more information, refer to Dell Wyse 5070 Conversion.
   - Wyse 5070 - 8 GB RAM and eMMC 32 GB or more.
   - Wyse 5070 Extended - 8 GB RAM and eMMC 32 GB or more.
4. The below platforms with Dell Hybrid Client 1.1.01 can be upgraded to Dell Hybrid Client 1.6. For more information, refer to Dell Hybrid Client 1.1.01 to Dell Hybrid Client 1.6 upgrade.
   - Wyse 5070 - 8 GB RAM and eMMC 32 GB or more
   - Wyse 5070 Extended - 8 GB RAM and eMMC 32 GB or more.
   - Dell OptiPlex 7070 Ultra.
5. The below platforms with any other OS (Windows 10, Ubuntu without DCA Enabler) can be converted to Dell Hybrid Client 1.6 using the ISO. For more information, refer to Dell OptiPlex and Latitude conversions.
   - Dell OptiPlex 7070 Ultra.
   - Dell OptiPlex 7070 Ultra.
   - Dell OptiPlex 7090 Ultra.
   - Dell Latitude 3320.

Topics:

- Supported management software

Supported management software

Table 1. Supported management software for DHC 1.6

Supported environment	
Management software	Wyse Management Suite
Edition	Pro
Version	3.5 and later

Table 2. Supported management software for DHC 1.1.01

Supported environment	
Management software	Wyse Management Suite
Edition	Pro
Version	3.3 and later

Dell Hybrid Client 1.1.01 to Dell Hybrid Client 1.6 upgrade

Prerequisites

- Download the **Dell Hybrid Client 1.6 - Image upgrade addon package** from the **Drivers and Downloads** section of the Dell Hybrid Client product page or the respective hardware product pages at www.dell.com/support.
- Download the ISO image corresponding to your platform model:
  - Dell Hybrid Client 1.6 - ISO Conversion Image for Wyse 5070
  - Dell Hybrid Client 1.6 - ISO Conversion Image for 7070 OptiPlex Ultra
- Extract the ISO file from the downloaded zip file.

Steps

1. Go to **Groups & Configs** and click the device group, **DHC-DEV-GRP**, where the earlier Dell Hybrid Client devices are registered.

   You can rename the device group.

2. Create two device subgroups. For example, **DhcUpgradeStageNotify** and **DhcUpgradeStageUpgrade** inside the device group, **DHC-DEV-GRP**.

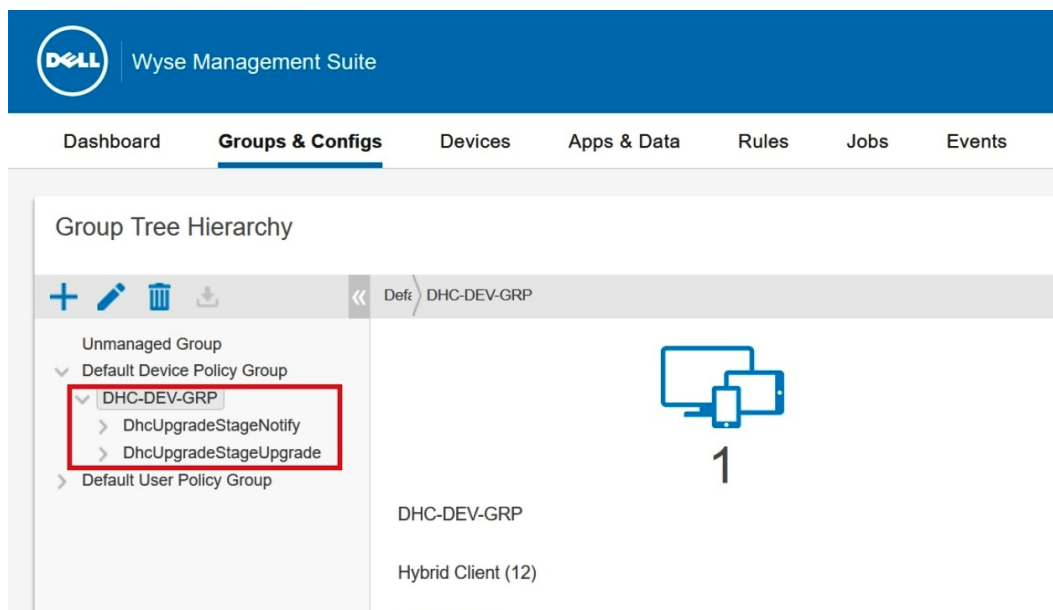   You can rename both the device subgroups.

Figure 1. Device sub-groups

3. Copy the image upgrade add-on and the image upgrade iso file, corresponding to the platform, to the Wyse Management Suite local repository—`<RepoPath>\repository\hybridClientApps>`. For example, `C:\WMSRepo3\repository\hybridClientApps`.
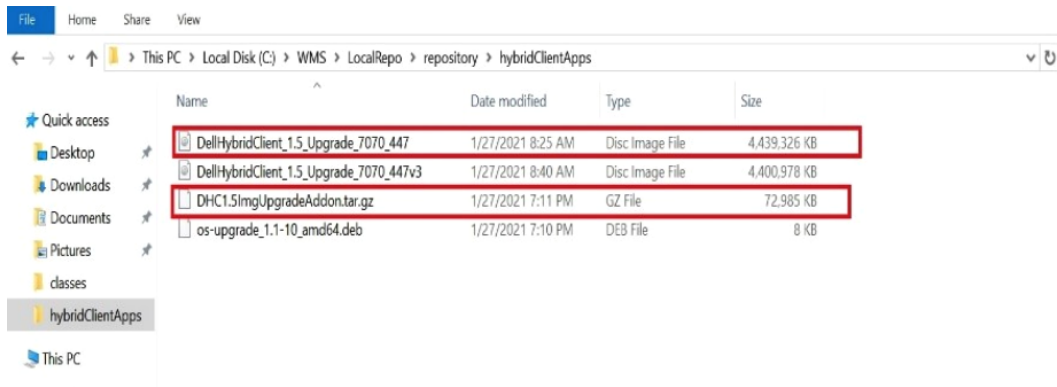
Figure 2. Wyse Management Suite local repository

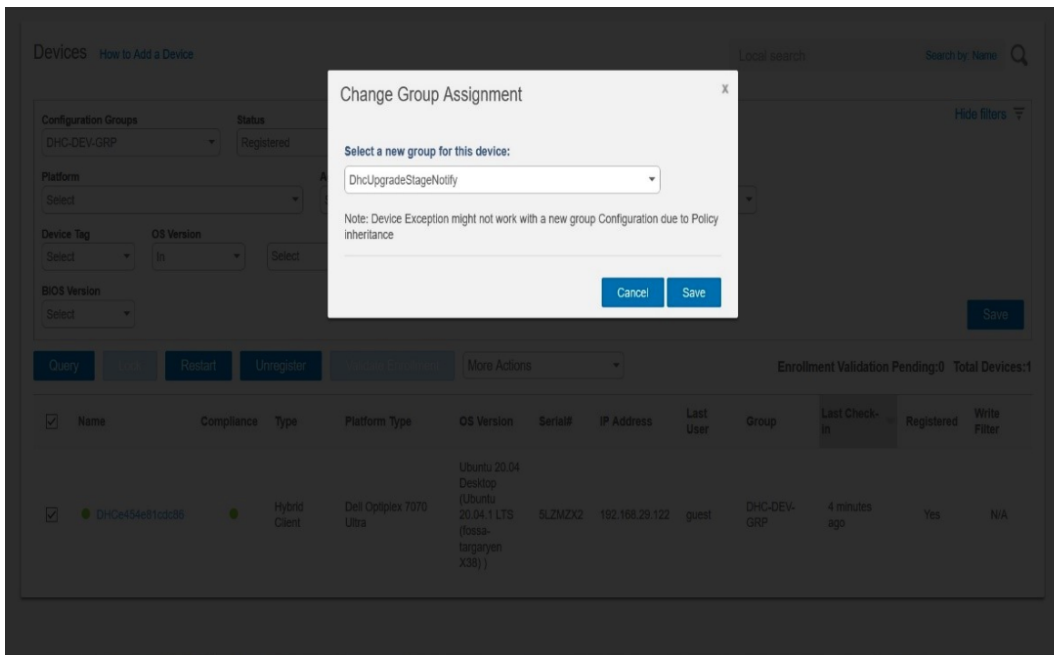4. Move the devices to be converted to the subgroup, **DhcUpgradeStageNotify**.

Figure 3. DhcUpgradeStageNotify

5. Select the subgroup, **DhcUpgradeStageNotify** and send notifications to the devices in the group using **SendMessage** in Wyse Management Suite for user data backup.
   An administrator can confirm that all the **SendMessage** alerts are successful on the **Events** tab.
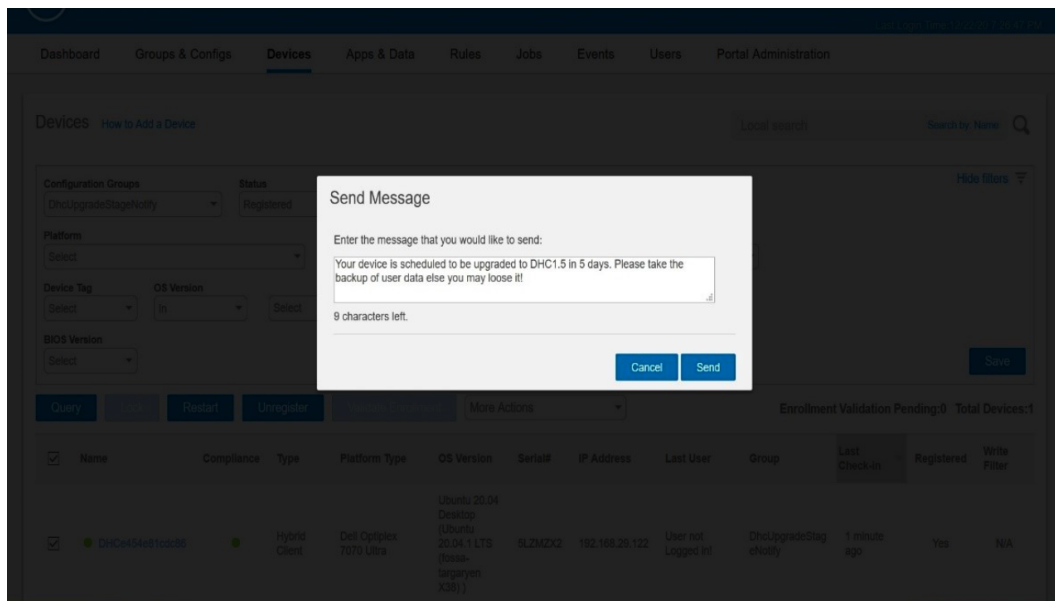
Figure 4. SendMessage

6. Once the defined number of days for user data backup elapses, the administrator can move the devices which have received the notification to the subgroup, **DhcUpgradeStageUpgrade**.
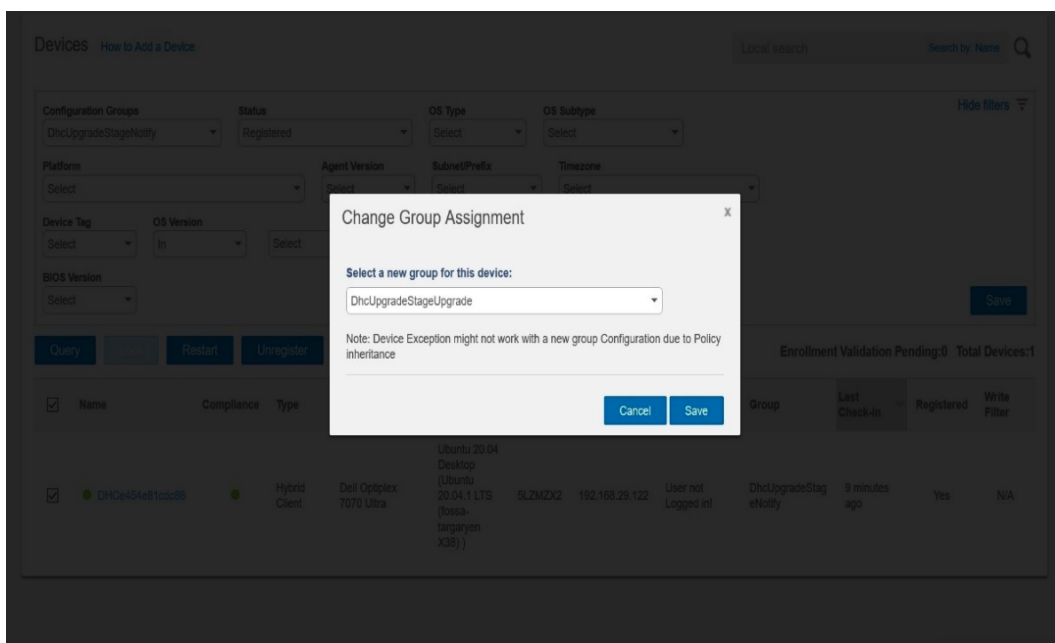

Figure 5. DhcUpgradeStageUpgrade

7. Go to **Apps & Data** and create the advanced app policy, **DHC1.6 Upgrade** for the subgroup, **DhcUpgradeStageUpgrade** to install Image upgrade add-on and the ISO conversion image respectively.

    Check the **Enable app dependency** option to ensure that the image add-on is installed first followed by the ISO image. This option is not applicable for Dell Hybrid Client 1.1.01.

    ⓘ **NOTE:** For Dell Hybrid Client versions 1.0 to 1.5, you must create the app policy for Ubuntu 18.04. It is not mandatory to create the app policy for Ubuntu 18.04 when you are running the Dell Hybrid Client version 1.1.01.

Figure 6. Install Image upgrade add-on and the ISO conversion image

8. If you have not configured the policy to apply on check-in, you can create the job for the DHC1.6 Upgrade app policy to install the add-on on the devices in the subgroup **DhcUpgradeStageUpgrade**.

Figure 7. DhcUpgradeStageUpgrade group

9. Once the job is successful the devices will upgrade to Ubuntu 20.04 with Dell Hybrid Client 1.6 and they are re-registered to the subgroup, **DhcUpgradeStageUpgrade**.

Figure 8. Upgrade successful

Convert Dell Wyse 5070 devices to Dell Hybrid Client

You can convert the Dell Wyse 5070 devices running Windows 10 IoT Enterprise LTSB, Windows 10 IoT Enterprise LTSC, ThinLinux 2.x, and ThinOS 8.6 to Dell Hybrid Client using Wyse Management Suite Pro version.

Topics:

*   Dell Wyse 5070 Conversion

Dell Wyse 5070 Conversion

Prerequisites

*   If the Wyse 5070 device running Windows 10 IoT does not have the latest boot agent which is equal or later than 4.0.9, download the **Merlin Boot Agent 4.0.9 for WIE10** package from the **Drivers and Downloads** section of the Wyse 5070 product page at https://www.dell.com/support. Install the boot agent on the device by following the install instructions provided on the support page.
*   If the Wyse 5070 device running ThinLinux 2.x does not have the latest boot agent which is equal or later than 4.0.8, download the **Boot Agent for ThinLinux 2.2** package from the **Drivers and Downloads** section of the Wyse 5070 product page at https://www.dell.com/support. Install the boot agent on the device by following the install instructions provided on the support page.
*   If the Wyse 5070 device running ThinOS 8.6_511 does not have the latest boot agent which is equal or later than 4.0.8, upgrade the ThinOS firmware to the latest version. For more information about how to update ThinOS firmware, see the latest *Dell Wyse Management Suite Administrator's guide* at https://www.dell.com/support.

    (i) **NOTE:** For Wyse 5070 devices with 16 GB or 32 GB storage capacity running ThinOS v8.6 or ThinLinux v2.x, only conversion to Dell Hybrid Client 1.1 is supported and conversion to Dell Hybrid Client v1.6 is not supported.
*   If you are converting Windows 10 IoT Enterprise devices to Dell Hybrid Client 1.1.01, download the **Dell Hybrid Client - Merlin Conversion Image for Wyse 5070** from the **Drivers and Downloads** section (Operating System—Ubuntu 18.04 LTS) of the Wyse 5070 product page at https://www.dell.com/support.

    If you are converting Windows 10 IoT Enterprise devices to Dell Hybrid Client v1.6, download the **Dell Hybrid Client 1.6 - Merlin Conversion Image for Wyse 5070** from the **Drivers and Downloads** section (Operating System—Ubuntu 20.04 LTS) of the Wyse 5070 product page at https://www.dell.com/support.

    After you download the .zip file, you must extract the EXE file.
*   If you are converting ThinLinux 2.x or ThinOS 8.6 devices with 16 GB storage capacity, download the **Dell Hybrid Client - Conversion Image for Wyse 5070 - 16 GB** from the **Drivers and Downloads** section of the Wyse 5070 product page at https://www.dell.com/support.
*   Ensure that you use Wyse Management Suite Pro version for thin clients in addition to the Dell Hybrid Client license. Dell Hybrid Client v1.6 supports Wyse Management Suite Pro version 3.5 or later.
*   Ensure that the number of Hybrid Client licenses is equal or more than the number of devices that need to be converted to Dell Hybrid Client. The Dell Hybrid Client licenses can be imported into Wyse Management Suite.
*   If Wyse Management Suite is set up on a public cloud and you want to register the conversion image to a public cloud, the local repository should be set up and configured locally. For more information about this feature, see the latest *Dell Wyse Management Suite Administrator's guide* at https://www.dell.com/support.

About this task

The process of converting Windows 10 IoT Enterprise LTSB, Windows 10 IoT Enterprise LTSC, ThinLinux 2.x and ThinOS 8.6 to Dell Hybrid Client removes the contents and partition structure of the existing drive. The conversion process preserves only the certificates and settings relevant to register the device to Wyse Management Suite. All other data, certificates and configuration settings are not preserved. After the conversion to Dell Hybrid Client, it is not possible to convert the device back to the original state. However, you can restore the original operating system using the Dell Wyse USB Imaging Tool 3.4 or later from the https://www.dell.com/support. The existing data and settings are not restored.

Steps

1. Register the Dell Hybrid client image to Wyse Management Suite. For details about how to register, see Adding Hybrid Client images to repository.
   - If the storage size of the device is more than 16 GB, use Dell Hybrid Client 1.1.01 or Dell Hybrid Client 1.6.
   - If the storage size of the device is 16 GB, use Dell Hybrid Client 1.1.01.
2. Create the Dell Hybrid Client image policy. For details on how to create Hybrid Client image policy, see Creating Hybrid Client image policies.
3. Convert the device to Dell Hybrid Client. For details on how to schedule an image, see Scheduling the image policy.
   - The device receives an image update notification. The boot agent downloads the image from the Wyse Management Suite repository and installs the Dell Hybrid Client image by internally triggering the Dell Recovery Tool. After the imaging is completed, the device boots to Dell Hybrid Client.
   - Dell Client Agent registers the device, as Dell Hybrid Client to Wyse Management Suite.
   - Wyse Management Suite manages the device as a Dell Hybrid Client device.
     - (i) **NOTE:** ThinOS devices with a 32 GB hard disk does not support direct upgrade tp Dell Hybrid Client 1.6 upgrade.

Adding Dell Hybrid Client Images to repository

Steps

1. Copy the Dell Hybrid Client conversion Image to the repository location or the operating system Images folder using Wyse Management Suite.
   - (i) **NOTE:** Dell Technologies recommends to copy the Image file to the local system and then copy the file to Wyse Management Suite repository location. Wyse Management Suite extracts the files from the zipped folder and uploads the files to the repository location or operating system Images folder.

   The Image is added to the repository.
2. Go to **Apps & Data** > **OS Image Repository** > **Hybrid Client** to view the saved Image.

Figure 9. Adding Dell Hybrid Client Images to repository

Creating Hybrid Client Image policies

Steps

1. Go to **Apps & Data**, click **Hybrid Client** under **OS Image Policies**.
2. Click **Add Policy** and go to **Edit Hybrid Client Policy** tab.
3. Enter the **Policy name** and select a group from the drop-down menu of the **Group** tab.
4. Select the operating system type from the drop-down menu of the **OS Type** tab.
5. Select an operating system subtype filter from the drop-down menu of the **OS Subtype Filter** tab.

   ⓘ **NOTE:** If you want to deploy an Image to a specific operating system or platform, select either **OS Subtype Filter** or **Platform Filter**.

6. Select an Image file from the drop-down menu of the **OS Image** tab.
7. Select **Force this version** from the drop-down menu of the **Rule** tab.
8. Select one of the following option from the drop-down menu of the **Apply Policy Automatically** tab:
   - **Do not apply automatically**—The Image policy is not applied automatically to a device registered with Wyse Management Suite.
   - **Apply the policy to new devices**—The Image policy is applied to a new device registered with Wyse Management Suite.
9. Click **Save**.
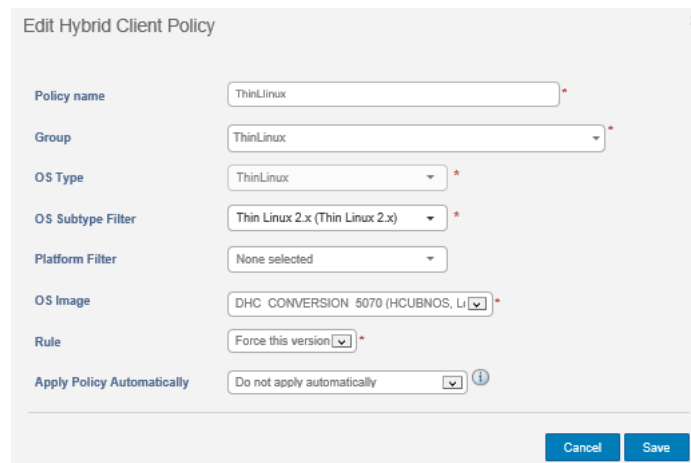
Figure 10. Creating Hybrid Client Image policies

Scheduling the Image policy

Steps

1. Go to **Jobs** and click the **Schedule Image Policy** tab.
   The **Image Update Job** tab is displayed.
2. Select a policy from the drop down menu of the **Policy** tab.
3. Enter the job description on the **Description** tab.
4. Select the date or time from the drop down list of the **Run** tab as following:
   - **Effective**— Enter the start and end date
   - **Start between**— Enter the start and end time
   - **On day(s)**— Select the days of the week
5. Click **Preview** to view details of the scheduled job.
6. Click **Schedule** to initiate the job.

Figure 11. Schedule a job

Convert Dell Generic Client to Dell Hybrid Client

1. **Converting Ubuntu 20.04 Dell devices with DCA Enabler to Dell Hybrid Client 1.6**
   a. Register the device to Wyse Management Suite using DCA-Enabler – device is registered as Dell Generic Client.
   b. To convert to Dell Hybrid Client 1.6, you must push the Dell Hybrid Client 1.6 bundle package file using the application policy. You can download the Dell Hybrid Client Bundle 1.6 package from the Drivers and Downloads section of the respective hardware product pages at https://www.dell.com/support.

2. **Converting Ubuntu 18.04 Dell devices with DCA Enabler to Dell Hybrid Client 1.1.01**
   a. Register the device to Wyse Management Suite using DCA-Enabler. DCA-Enabler version 1.2 is required to convert Ubuntu 18.04 or 20.04 on Dell Ubuntu Generic device to Dell Hybrid Client. You can check that the DCA-Enabler version after your device is registered to Wyse Management Suite.
      ● If the DCA-Enabler version is 1.1.0-17 or lower, Dell Ubuntu devices are registered to Wyse Management Suite as Dell Hybrid Client.
      ● If the DCA-Enabler version is 1.2.0-xx or greater, the devices are registered as Dell Generic Client.

      To upgrade to DCA-Enabler 1.2, you can download the DCA-Enabler version 1.2.0-xx package from the Drivers and Downloads section of the Dell Wyse Management Suite product page at www.dell.com/support. You must register the device to Wyse Management Suite 3.5 and follow the Install Instructions that are mentioned on the support page to deploy the DCA-Enabler version 1.2.0-xx package to the device.

   b. To convert to Dell Hybrid Client 1.1.01, you must push the Dell Hybrid Client 1.1.01 bundle package files using the application policy. You can download the Dell Hybrid Client Bundle 1.1.01 package from the Drivers and Downloads section of the respective hardware product pages at https://www.dell.com/support.

3. **Converting Ubuntu 18.04 Dell devices with DCA Enabler to Dell Hybrid Client 1.6**
   a. Register the device to Wyse Management Suite using DCA-Enabler. DCA-Enabler version 1.2 is required to convert Ubuntu 18.04 or 20.04 on Dell Ubuntu Generic device to Dell Hybrid Client. You can check that the DCA-Enabler version after your device is registered to Wyse Management Suite.
      ● If the DCA-Enabler version is 1.1.0-17 or lower, Dell Ubuntu devices are registered to Wyse Management Suite as Dell Hybrid Client.
      ● If the DCA-Enabler version is 1.2.0-xx or greater, the devices are registered as Dell Generic Client.

      To upgrade to DCA-Enabler 1.2, you can download the DCA-Enabler version 1.2.0-xx package from the Drivers and Downloads section of the Dell Wyse Management Suite product page at https://www.dell.com/support. You must register the device to Wyse Management Suite 3.5 and follow the Install Instructions that are mentioned on the support page to deploy the DCA-Enabler version 1.2.0-xx package to the device.

   b. To convert to Dell Hybrid Client 1.6, you must push the Dell Hybrid Client ISO package using the application policy.
      ● You must first can download the os-upgrade_1.1-16_amd64.zip and deploy the Dell Hybrid Client 1.5 - OS Upgrade pack.
      ● Download the Dell Hybrid Client 1.6 ISO for Dell OptiPlex 7070 Ultra and deploy the Dell Hybrid Client 1.6 ISO package file.

For information about how to deploy an application policy using Wyse Management Suite, see the *Create and deploy standard application policy to Dell Generic Clients* section and the *Create and deploy advanced application policy to Dell Generic Clients* section in the Dell Wyse Management Suite Administrator's Guide at www.dell.com/support.

For information about how to register and configure Dell Generic Client using Wyse Management Suite, see the *Register and configure Dell Generic Client using Wyse Management Suite* section in the Dell Wyse Management Suite Administrator's Guide at www.dell.com/support.

(i) **NOTE:** Before the device conversion is initiated, DCA-Enabler backs-up Wyse Management Suite connection data and then triggers the Dell Hybrid Client ISO or installer bundle.

The installer completes the conversion and device restarts automatically. After the conversion, the device boots into the converted Dell Hybrid Client operating system. Dell Client Agent reads the backed-up Wyse Management Suite connection data and registers to Wyse Management Suite server as a Dell Hybrid Client device.

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Dell OptiPlex and Latitude conversions

You can convert the Dell OptiPlex 7070 Ultra, Dell OptiPlex 3090, Dell OptiPlex 7090, and Dell Latitude 3320 systems running Windows 10 to Dell Hybrid Client 1.6.

Prerequisites

- Ensure that you have configured the USB bootable drive with the ISO image.
  1. Go to https://www.dell.com/support and search for the device product page or the Dell Hybrid Client product page.
  2. Click **Drivers and Downloads** and download the zip file.
  3. Extract the ISO file from the zip file.
  4. Create a USB bootable media using one of the following methods:
     ○ If using Windows, do the following:
        a. Download and install the OS Recovery tool from https://www.dell.com/support/home/en-in/drivers/osiso/recoverytool.
        b. Open the Dell OS Recovery Tool and select the **SWITCH TO ADVANCED RECOVERY** option.
        c. Under **Select an OS** Image, browse to the ISO file and open.
        d. Click **NEXT**.
        e. Plug in a USB drive and select the USB drive on the screen.
        f. Click **BURN OS**.
     ○ If using Linux, you can follow the steps that are mentioned in https://www.dell.com/support/article/en-in/sln301761/how-to-use-the-dell-hosted-recovery-image-of-linux.
     ○ You can also use other Third party tools to prepare a bootable USB drive with the ISO.
- Ensure that the number of Hybrid Client licenses is more than the number of devices to be converted to Dell Hybrid Client. The Dell Hybrid Client licenses can be imported into Wyse Management Suite.

About this task

The process of converting Ubuntu and Windows 10 to Dell Hybrid Client does not preserve any data, certificates, or configuration settings from the original operating system. However, you can restore the original operating system using the OS Recovery Tool from the https://www.dell.com/support. The existing data and settings are not restored.

Steps

1. Go to **BIOS setup** > **Secure Boot** and clear **Secure Boot Enable**.
2. Go to **BIOS setup** > **System Configuration** and select **SATA Operation** as AHCI.
3. Plug in the bootable USB drive into the device and boot the device to USB drive.
4. Select **restore entire hard drive** option on the Dell recovery screen and continue.

   (i) **NOTE:** Select a drive, if device has multiple drives available.

   The device boots into Dell Hybrid Client when the installation is completed. The device registers to Wyse Management Suite by the auto discovery method. Alternatively, you can register the device manually to Wyse Management Suite using the Dell Client Agent user interface.

   For information about how to use the Dell Client Agent window to manually register the device to Wyse Management Suite, see the *Dell Hybrid Client Administrator's Guide* at https://www.dell.com/support.

Frequently asked questions

The FAQs mentioned in this section are applicable to Wyse 5070 devices with 16 GB storage capacity.

1. **Why is the 16 GB image required separately?**

   The existing Dell Hybrid Client 1.0 image when deployed to a 16 GB eMMC, provides a free space of approximately 1.9 GB or less. This amount of space is not sufficient to install your local applications or store your local files, or cache requirements.

2. **How do I create additional free space on my USB drive?**

   Uninstall or delete applications and files that are not in use.

3. **Which are the default VDI applications available on Wyse 5070 devices with 16 GB storage capacity?**

   By default, no VDI applications are preinstalled in the Dell Hybrid Client image for Wyse 5070 devices with 16 GB storage capacity. The following VDI applications are available as Dell-signed add-on packages:

   - Citrix Workspace App
   - VMware View Horizon client
   - Zoom Client

4. **What is the amount of free space available after the conversion process?**

   The amount of free space available after the conversion process is around 4.5 GB.

5. **Is there a separate guide provided for 16 GB kit?**

   There is no separate guide that is provided for the 16 GB kit.

   > (i) **NOTE:** Ensure that you deploy the correct size image based on the device storage size.

6. **What happens if there is a network failure or an interruption during the conversion process?**

   If there is a network failure or an interruption during the conversion process, the device gets corrupted. The following steps restore the device to its original state:

   a. Unregister and delete the device from Wyse Management Suite.
   b. The device can be imaged with the conversion image using USB Imaging Tool 3.4 and later. This applies only when DHC_CONVERSION_5070.exe or DHC_CONVERSION_5070_16GB.exe is downloaded.
      > (i) **NOTE:** For information about how to use USB Imaging Tool, see the *Dell Wyse USB Imaging Tool v3.4 User's Guide* that is available on the Wyse 5070 manuals page at www.dell.com/support.
   c. Cancel the existing **Image Conversion Job** from Wyse Management Suite.
   d. Device registers to Wyse Management Suite by the auto discovery method. However, you must register the device manually using the Dell Client Agent user interface to Wyse Management Suite. The Dell Hybrid Client license is used after the device is registered. For more information about how to register the device manually, see the USB Imaging Tool 3.4 User's Guide at https://www.dell.com/support.

7. **What changes are made on a device with 16 GB storage capacity to provide free space?**

   The following are the modules that are deleted as they are not part of the minimal installation of Ubuntu along with other related icon and png files:

   - Aisleriot
   - Baobab
   - Branding-Ubuntu
   - Cheese
   - deja-dup
   - example-content
   - gir1.2-rb-3.0:amd64
   - gir1.2-totem-1.0:amd64
   - gnome-calendar
   - gnome-mahjongg
   - gnome-mines

- gnome-sudoku
- gnome-todo
- gnome-todo-common
- gnome-video-effects
- guile-2.0-libs
- hyphen-en-us
- libavahi-ui-gtk3-0
- libgnome-games-support-1-3
- libgnome-games-support-common
- libgnome-todo
- libmessaging-menu0
- libminiupnpc10
- libnatpmp1
- librhythmbox-core10
- libtotem0
- mythes-en-us
- python3-uno
- remmina
- remmina-common
- remmina-plugin-rdp
- remmina-plugin-secret
- remmina-plugin-vnc
- rhythmbox
- rhythmbox-data
- rhythmbox-plugin-alternative-toolbar
- rhythmbox-plugins
- Shotwell
- shotwell-common
- simple-scan
- citrix-client
- thunderbird
- thunderbird-gnome-support
- thunderbird-locale-en
- thunderbird-locale-en-us
- totem
- totem-common
- totem-plugins
- transmission-common
- transmission-gtk
- ubuntu-web-launchers
- usb-creator-gtk
- vino
- vmware-client
- zeitgeist-core
- adium-theme-ubuntu
- bolt
- command-not-found-data
- dmz-cursor-theme
- evince-common
- friendly-recovery
- gnome-software
- gnome-software-common
- gnome-accessibility-themes
- gnome-themes-extra-data
- imagemagick-6-common
- netpbm

- speech-dispatcher-audio-plugins
- tcpdump
- ubuntu-release-upgrader-core
- ubuntu-report
- unattended-upgrades
- whoopsie
- xcursor-themes
- yelp-xsl
- gdb
- gnome-mahjongg
- gnome-sudoku
- libqqwing2v5
- gnome-mines
- netcat-openbsd
- vim
- vim-runtime

The following documents are removed to provide free space on a device with 16 GB storage capacity:
- /usr/share/man
- /usr/share/groff
- /usr/share/info
- /usr/share/lintian
- /usr/share/linda
- /var/cache/man

The following steps and commands have been performed to provide free space on a device with 16 GB storage capacity:
- Delete dependent packages that were automatically installed and are no longer needed.
- Clean the local repository of retrieved packages.
- Delete Snap, as it is replaced by Apt-get
- Delete local cache.
- Delete and disable the dpkg log to avoid dynamic memory increase.
- Delete apt caches to avoid dynamic increase of memory utilization.
- Delete the existing cache of Google Chrome and Firefox.
- Limit the cache of Google Chrome and Firefox to 150 MB for future use.

8

Contacting Dell

Prerequisites

ⓘ **NOTE:** If you do not have an active internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

About this task

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell sales, technical support, or customer service issues:

Steps

1. Go to www.dell.com/support.
2. Select your support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.