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Windows installation guide

Delivery

The package contains all the resources needed to run the IP virtual card.

Once this package is installed, you will be able to run any application linked to the IP Virtual

Card solution.

Prerequisites

Target platform

Hardware :

- CPU speed : minimum 2.1GHz
- CPU architecture : 64 bits
- NIC bandwidth : minimum 10Gb/s
- If used with DPDK, the CPU must support the following instruction sets:
  - SSE 4.2;
  - AVX/AVX2;
  - CLMUL;
  - RDRAND/RDSEED;
  - Those instructions are supported by
    - Intel Broadwell CPUs and more recent;
    - AMD Zen CPUs and more recent.

Supported OS: - Windows 10 - Windows 11 - Windows Server 2019 - Windows Server 2022

Drivers:

- NIC drivers must be properly installed and up to date

Software

In order to intall IP Virtual Card, Python (v3.8 and higher) is required.

Installation

The installation is automated by the executable `[package_name].exe`.

This install wizard must be launched with administrator rights.

The wizard will :

- install and register DELTA PTP as a service
- install kbdpdk
- install and register the VirtualCardService as a service
- install VideoMasterIP libraries
- install licensing module
- create a rule in the firewall to allow VirtualCardService network communication.

Uninstall

The uninstallation is automated by the executable `Uninstall.exe` present in the install folder.

KBDPDK (Optional)

This section is only useful if you wish to use the IP Virtual Card with the DPDK kernel bypass instead of Windows sockets.

Supported NIC

At the moment, only **Intel** NIC's are supported by the KBDPDK integration.

In particular, extended tests have been done with Intel XXV710 and Intel E810 NIC's.

NIC setup

In order to use a NIC with the KBDPDK, the NIC needs to be bound to DPDK.

This is done by installing the netuio driver on the desired NIC.

To do so, follow the following step:

- Open the Device Manager (devmgmt.msc);
- In the "Network Adapter" section, right-click on the desired NIC;
- Select "Update Driver", then "Browse my computer for drivers" and "Let me pick from a list...";
- on the next screen, click "Have disk" and browse to the following folder : `C:\Program Files\DELTACAST\VCS\netuio`;
- In the "Model" box, a driver should be present. Click "Next";
- If the operation was successful, you should see a new device the "Windows UIO" section of the device manager.

If you wish to use the bound NIC with the official drivers, right-click on it an select "Uninstall Device".
Once this is done, the NIC will disappear from the "Windows UIO" section and reappear in the "Network adapter" section

Intel NIC

The following steps must be performed to use Intel E810 NIC's with the KBDPDK.
No special setup is required for Intel XXV710 NIC's.

Intel E810

To use Intel E810 NIC's, some additional steps must be performed:

- Install official Intel drivers:
  - Download the last driver pack from Intel;
  - Extract the archive and run `APPS\SETUP\SETUPBD\Winx64\SetupBD.exe`;
- Update the NIC firmware :
  - Extract `NVMUpdatePackage\E810\E810_NVMUpdatePackage_vX_XX_Windows.zip` and browse to the extraction folder;
  - Open a Administrator command prompt and execute `E810_NVMUpdatePackage_vx_xx_Windows.exe`;

    - Follow the instructions to update de NIC firmware.
- Use a custom DDP package :
    - Browse to `DDP_Profiles\810_Series`;
    - Extract `ice-X.X.XX.X.zip` and browse to the extraction folder;
    - Copy the file ice-X.X.XX.X.pkg in the VCS installation folder and rename it `ice.pkg`.

NVIDIA NIC

To use Nvidia ConnectX, some additional steps must be performed:

- Download the last WinOF2 driver (`>24.10`) from Nvidia website
- Install the driver

As DevX is not enabled by default to work in WinOF-2 driver, manual configuration is required as described below: 1. Open Device manager and locate the Mellanox device. 2. Right click and open the Properties. 3. Go to the Details tab. 4. Select the Driver key in the Property list. 5. Save the value you received. For example: {4d36e972-e325-11ce-bfc1-08002be10318}\0003 6. Open the registry editor (in console type regedit) RUN AS ADMINISTRATOR. 7. Navigate to HKEY_LOCAL_MACHINE. Select the class as shown in the driver key you extracted in step 5. For example: {4d36e972-e325-11ce-bfc1-08002be10318}. 9. Select the device number as in step 5. For example: 0003. 10. Create a new key with name `DevxEnabled` of type DWORD and set the value `1`. 11. Create a new key with name `DevxDynFsEnabled` of type DWORD and set the value `1`. 12. Create a new key with name `DevxFsRules` of type DWORD and set the value `0x7FFFF`. 13. Create a new key with name `DevxDynFsMaxPatterns` of type DWORD and set the value `256`.

14. Restart the driver. DevX Lib will be able to detect your device now.
15. Verify `DevX=True`, `DevxDynFsEnabled=True`, `DevxDynFsMaxPatterns=256` and `DevxFsRules=0x7FFFF` for the enabled adapter, run “mlx5cmd -stat”

Hugepages activation

In order to use DPDK, hugepages creation must be allowed for the user running VCS.

To do so, follow these steps: - Open “Control Panel / Computer Management / Local Security Policy” (or Win+R, type “secpol.msc”, press Enter). - Open “Local Policies / User Rights Assignment / Lock pages in memory”; - Add the “Administrators” user group to the list of grantees. Privilege is applied upon next logon. - If the right is not correctly applied, an error will be reported when running the configuration script.

VCS configuration

The VCS configuration is done through `ipvc_configure.exe`. It has to be run using administrator rights.

It is located in `C:\Program Files\DELTACAST\VCS`

The script works in 2 different modes : interactive and silent.

Interactive Mode

In interactive mode, the script will ask you to enter the configuration parameters one by one. After entering all the parameters, the script will ask you if you want to save the configuration in a file. Then it will ask you if you want to apply the configuration to the system. By default, the configuration file is saved in the current directory and is named `ipvc_config.cfg`.

Silent Mode

In silent mode, the script will use the configuration file passed as an argument. Using the following command, the script will apply the configuration to the system:

```
.\ipvc_configure.exe --config [CONFIG_FILE]
```

Performance considerations

BIOS

According to our observations, C-states, P-states or any energy-saving parameters must be disabled in the BIOS.

This ensures that the computer is running at its peak performance.

Not following the recommendations can lead to unstable or non-compliant streams.

Conductor configuration

The CPU core associated to a conductor must not be used by any process.

If the hyper-threading is activated, the same guideline must be applied to the associated logical core.

Licensing

The IP Virtual Card solution is secured by a license manager called **dlmcli.exe**.

To uniquely identify the platform on which the IP Virtual Card runs, dlmcli takes several parameters into account. One of those parameters is the MAC address of one of the NICs present in the machine. To avoid license issues in case of network configuration change, we recommend to force dlmcli to use the MAC address of a specific NIC that should never be removed or used by IP Virtual Card (motherboard integrated NIC by example). For that, use the following argument while you add the first license: `--select-custom-mac ############`

If a custom MAC address is not provided with the first license entry, dlmcli will warn you and list all the available NIC MAC address.

To add a license in online mode , use the following command:
`.\dlmcli.exe activate ####-####-####-####-####-####-####-#### [--select-custom-mac ############]`
In order to add a license in online mode, the system time must be correct.

To add a license in offline mode, use the following command:
`.\dlmcli.exe activate --offline requestfile.bin ####-####-####-####-####-####-####-#### [--select-custom-mac ############]`
Provide the processed requestfile.bin to DELTACAST. In return, DELTACAST will provide you a response file. Then use the following command:
`.\dlmcli.exe process responsefile.bin`

To update the licensing information in VCS, without having to restart it, call the `VMIP_RefreshLicensing()` function.
You can also compile and run the `sample_refresh_licensing`.

To remove, transfer, repair, unlock, or perform any other operation on a licence, please contact DELTACAST.

Virtual machine support

Configuration

The virtual machine support is only available with network cards configured in PCI passthrough. Socket and DPDK mode are both available in virtual machine.

PTP

NTP disabling

In order to have a proper PTP synchronization, the NTP service must be disabled. The installation of the IP Virtual Card will automatically disable NTP.