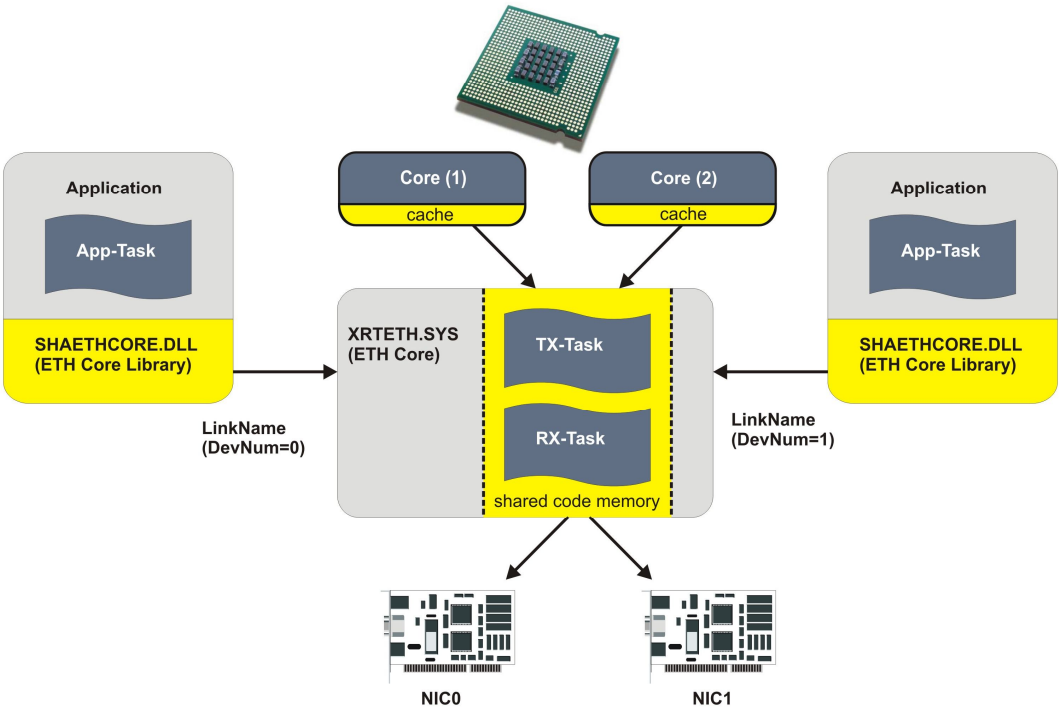
TechNews:
Separated Driver Context

Understanding Multi-Core Management

The Problem

Shared memory areas for real-time operation can influence each other. In particular, when operating multiple real-time CPU cores, complex cache situations often arise due to shared code areas in memory.



In the past, the asynchronous code execution within the same ethernet core had been done by sharing the driver code with different stack areas (selected by the parameters DevNum = 0, DevNum). Therefor a shared communication channel had been used.

As benefit, only one common ethernet driver was required, with a common link name. This common ethernet driver was used by several ethernet (NIC) adapters. Even this technique is working well, it causes wait states and synchronization issues when executing the code asynchronously, even the stack data space is separated.

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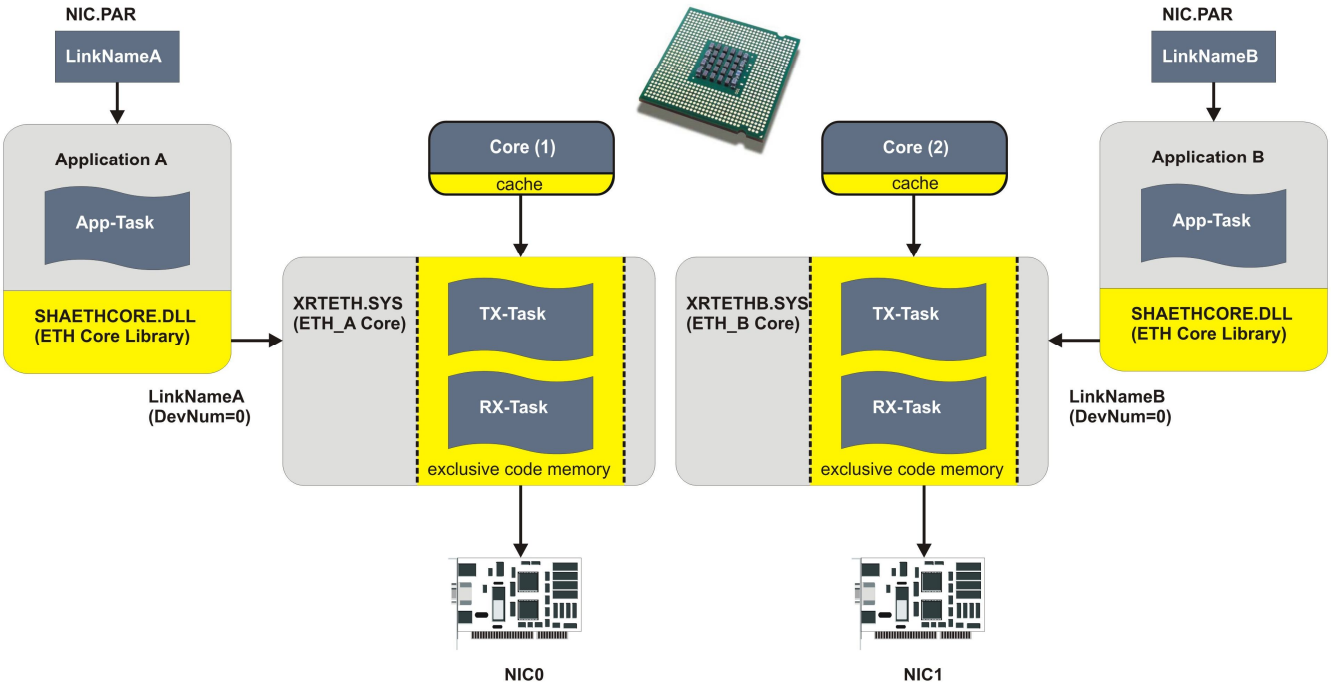
The Solution

The solution is to separate the Ethernet driver context, simply done by duplicating the driver itself. Therefore, for installation a second INF-File is required with a second, slightly renamed Ethernet driver. To make shure, also the driver interface is different, the link name has to be unique on each driver. This link name is generated out of the driver name which then has to be used by the Application and it's Core-DLL.

Since there is a static linked, shared Ethernet Core-DLL, there is no way, to provide a different link name at calling time. Therefore, the link name has to be provided by a parameter file, called NIC.PAR, residing in the application directory.



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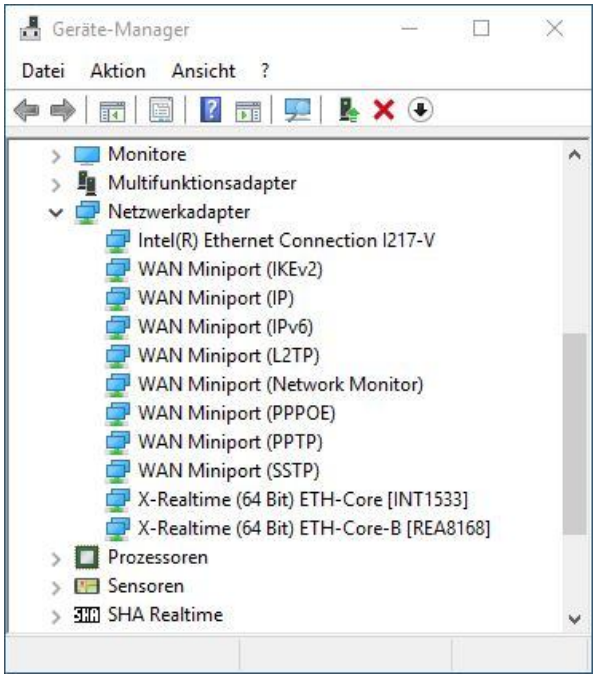
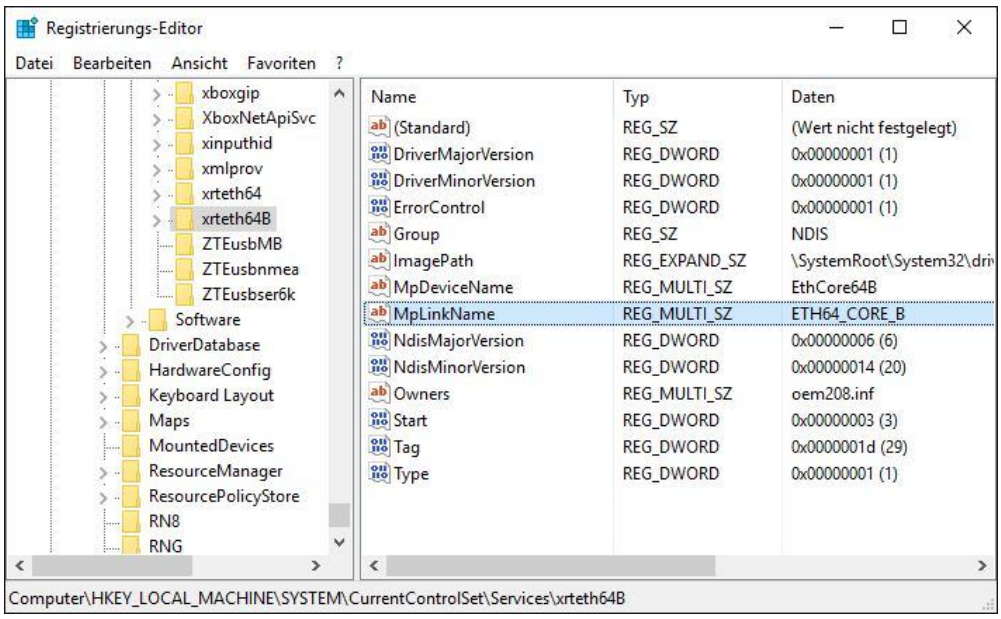
Installation with the Ethernet core driver

The Ethernet Core-A driver (XRTETH.SYS) has to be installed as usual by the setup program. In contrary, the second driver has to be installed directly within the device manager by selecting the provided Core-B driver (XRTETH64B.SYS) at installation.



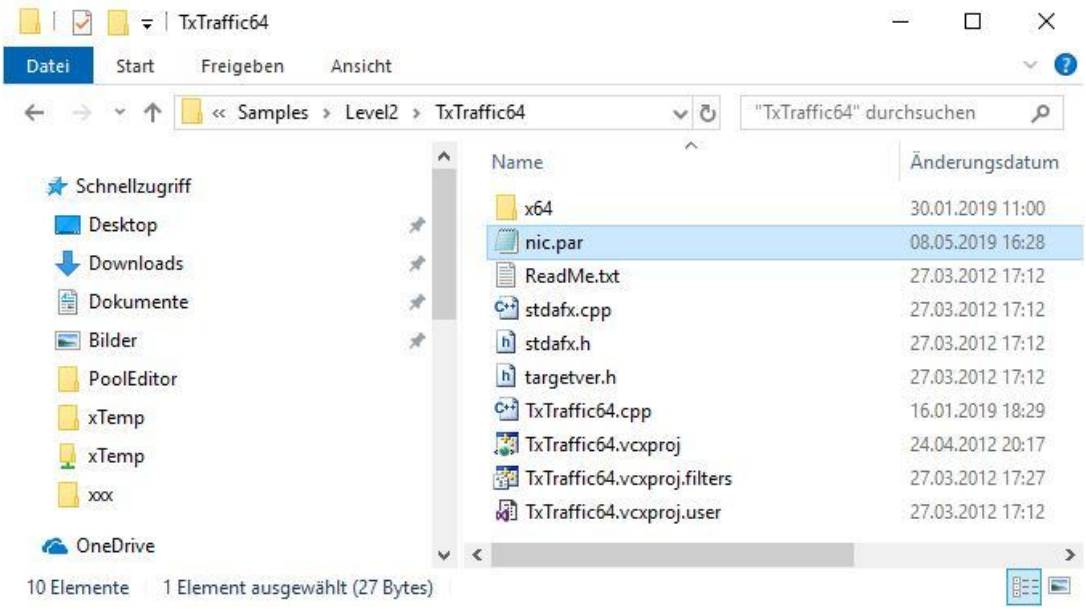
LinkName of Ethernet core driver

While the LinkName of the Ethernet Core-A driver is “ETH64_CORE”, the LinkName of the Core-B driver is by default “ETH64_CORE_B” (this can be found also within the registry. The name can be changed).



Parameter file NIC.PAR

The parameter file has to reside inside the application directory to be recognized.



The content of the parameter file is as follows: