


Reference	Language	Visa	Date	Indice
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PCI FIP card 2.0

Performances FIPCore vs FDM With m-FullFIP2 Under Linux patch Preempt



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003				

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1. INTRODUCTION

1.1. SCOPE OF THE DOCUMENT

The purpose of this document is to realize performance tests on the FIP / WorldFIP PCI 2.0 card with FIPCore and FDM libraries (*FIP Device manager*) with m-FullFIP2 module on pci card.

1.2. DOCUMENTS REFERENCES

ID	Titre	Référence
/		/
		/

2. INITIAL CONDITIONS

In the tests below, the minimum value is retained, this being independent of the material used. The minimum value significantly characterizes the performance of the PCI card. Several FIP cards inside same chassis should decrease performances.

2.1. CONFIGURATION PC

PXle FIP V2.0– 1 Mbits	
OS	Linux (Ubuntu 18.04 LTS)
Version linux patch	Patch LINUX preempt 5.6.19-rt11.patch
FIPCore library	WorldFIPTools 6.1.6 package
FDM library	V4.9.1 – FIPCode 6
PC	Kernel 5.3.059 generic - Arch 64 bits
CPU	Intel(R) Core(TM) i7-9700K CPU @ 3.60GHz
RAM	16GB
Driver	Driver : v2.7 (FIP/WorldFIP station driver for PCI/PCIe board [FIPCode6])

2.2. SOFTWARE CONFIGURATION

2.2.1. FDM

FDM : v4.9.2 - Free access (avec optimization 64-bit)

user_opt.h

FDM_WITH_DTACK YES

FDM_WITH_FREE_ACCESS YES

FDM_WITH_PLX9050 YES

2.2.2. FIPCORE

FIPCORE uses DMA (Direct access Memory)

2.3. ABOUT MIN_VALUE - AVERAGE_VALUE - MAX_VALUE

- Min_value : show performance of the FIP card mainly
- Average_value and max_value : these values are dependent of the material used, Operating system, configurations of bios, components of motherboards, number of devices used...

2.4. PATCH LINUX RT PATCH PREEMPT

The RT-Preempt patch converts Linux into a fully preemptible kernel

This version of Linux with PATCH-PREEMPT RT offers interesting results without changing software and driver used for FIP card.

2.5. FIP CONFIGURATION

Speed bus: 1 Mbits

Mode station tested: bus arbitrator

2.6. FIP CARD

1 card FIP WorldFIP installed, bi-bimedium (1 FullFIP 2),with mPCIe module.

2.7. BIOS CONFIGURATION

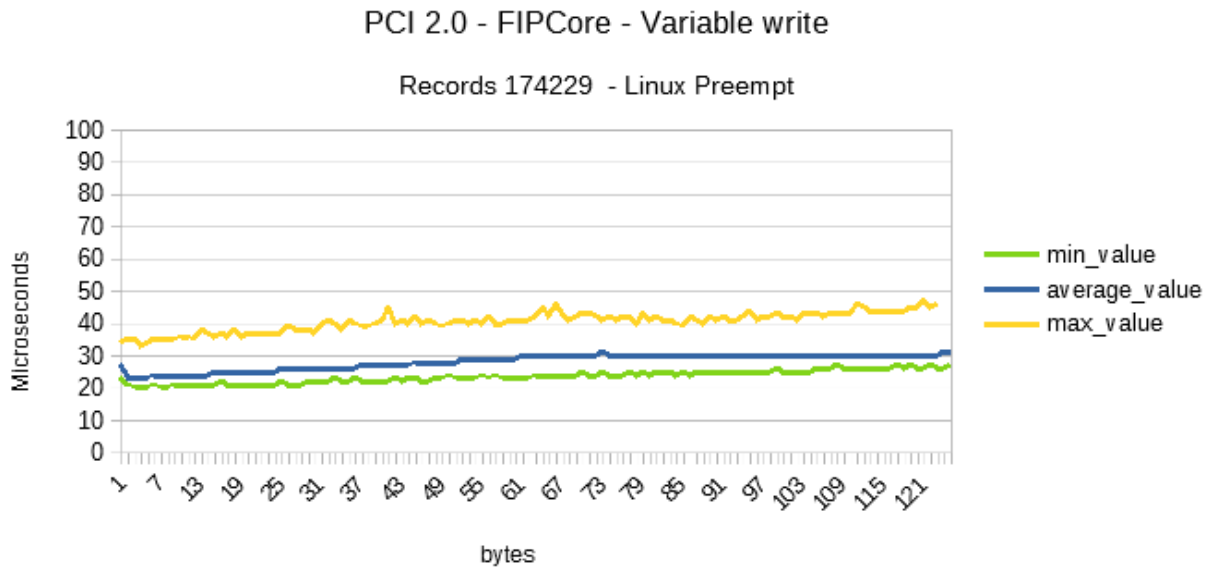
All optimizations are disabled (*Power saving, CPU power, CPU states, Intel speed step...*)

3. COMPARATIVE TESTS AND PERFORMANCES

3.1. VARIABLE WRITE

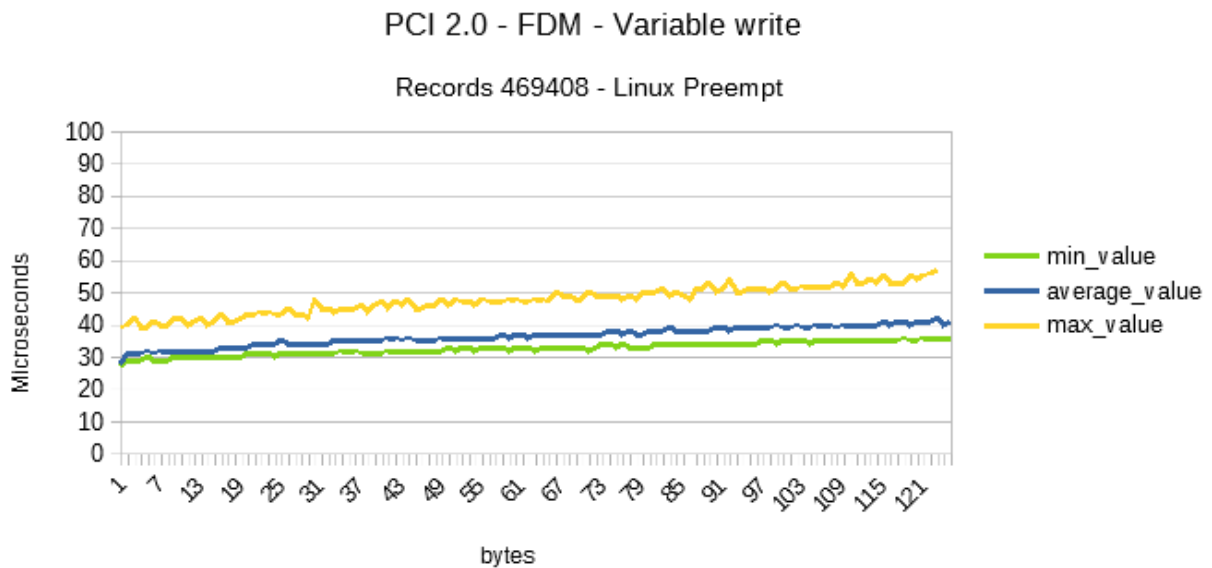
3.1.1. FIPCORE

FipCore function measurement: fipcore_write_var_by_id



3.1.2. FDM

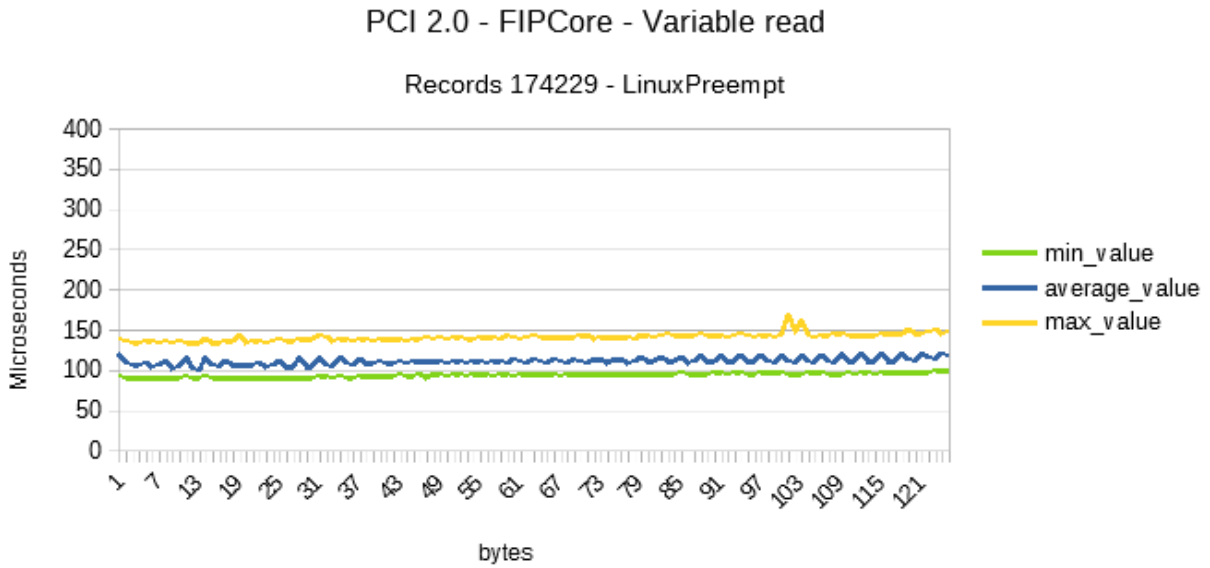
FDM function measurement : fdm_mps_var_write_loc



3.2. VARIABLE READ

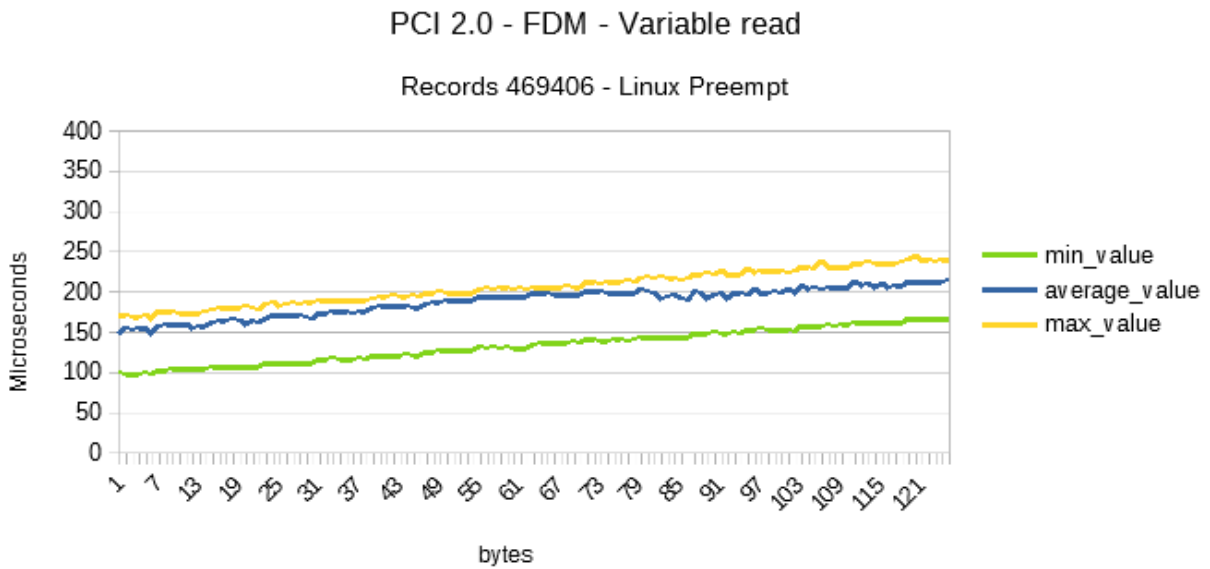
3.2.1. FIPCORE

FipCore function measurement : fipcore_read_var_by_id



3.2.2. FDM

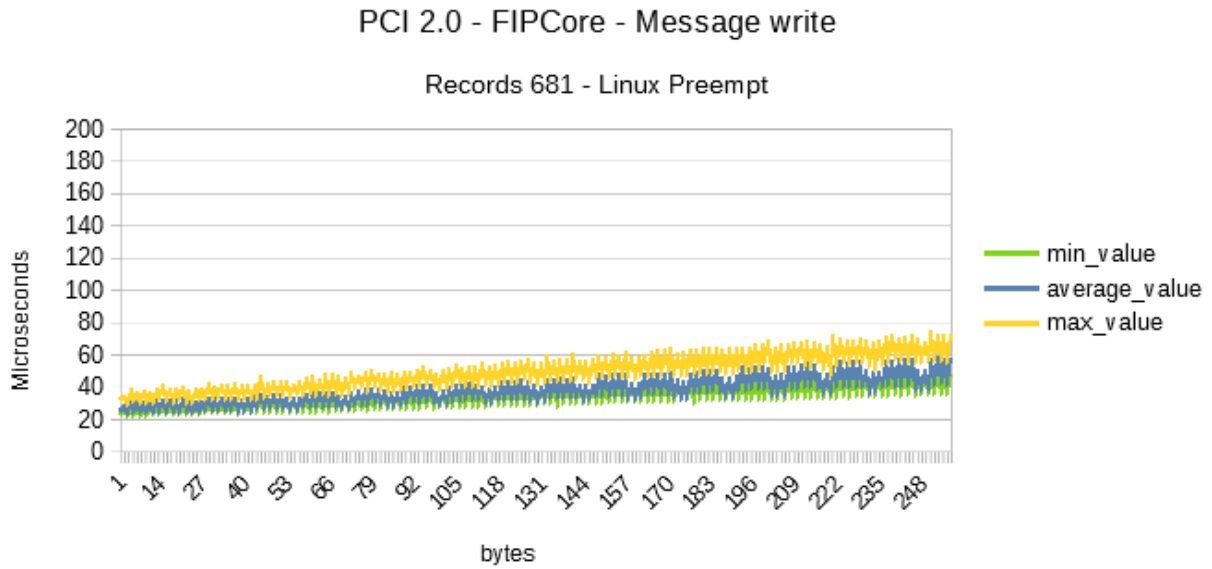
FDM function measurement: fdm_mps_var_read_loc



3.3. MESSAGE WRITE

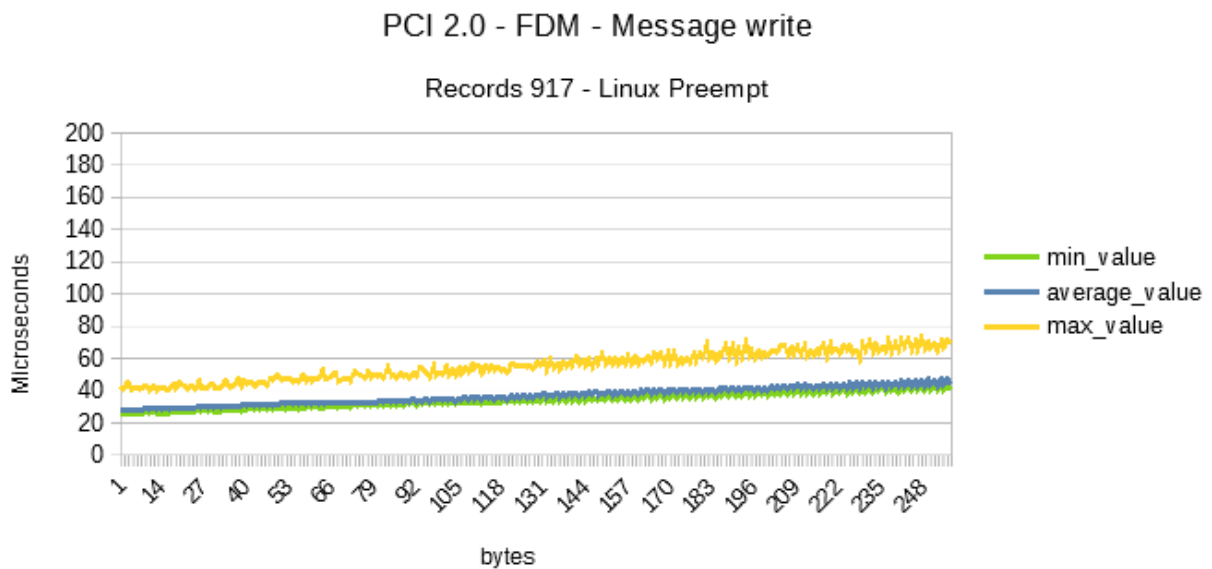
3.3.1. FIPCORE

FipCore function measurement: fipcore_write_msg



3.3.2. FDM

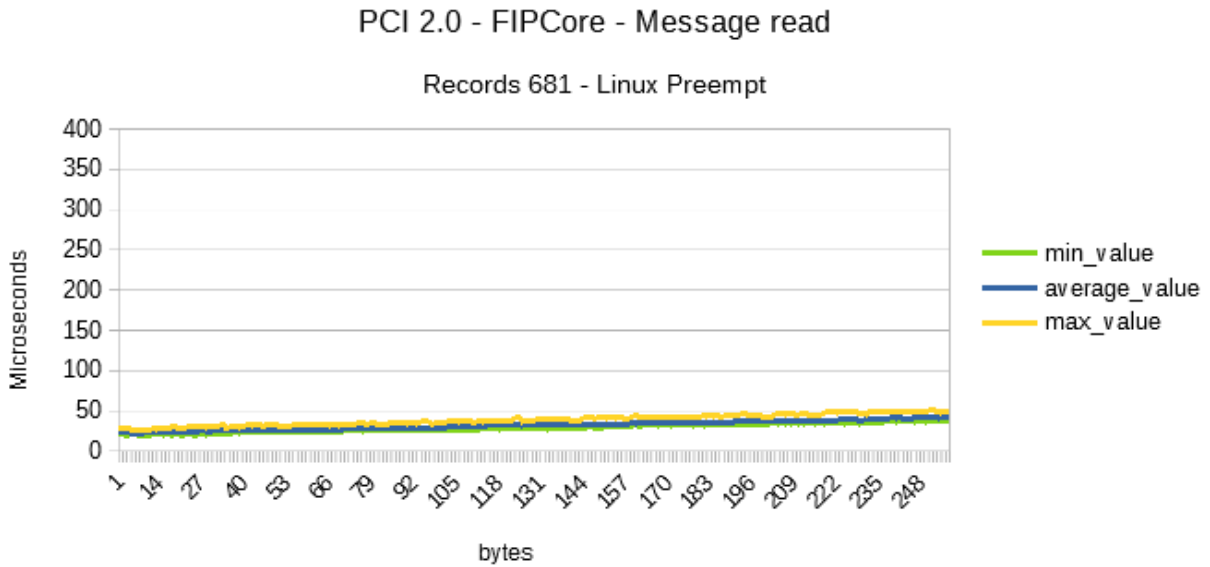
FDM function measurement : fdm_msg_fifo_empty



3.4. MESSAGE READ

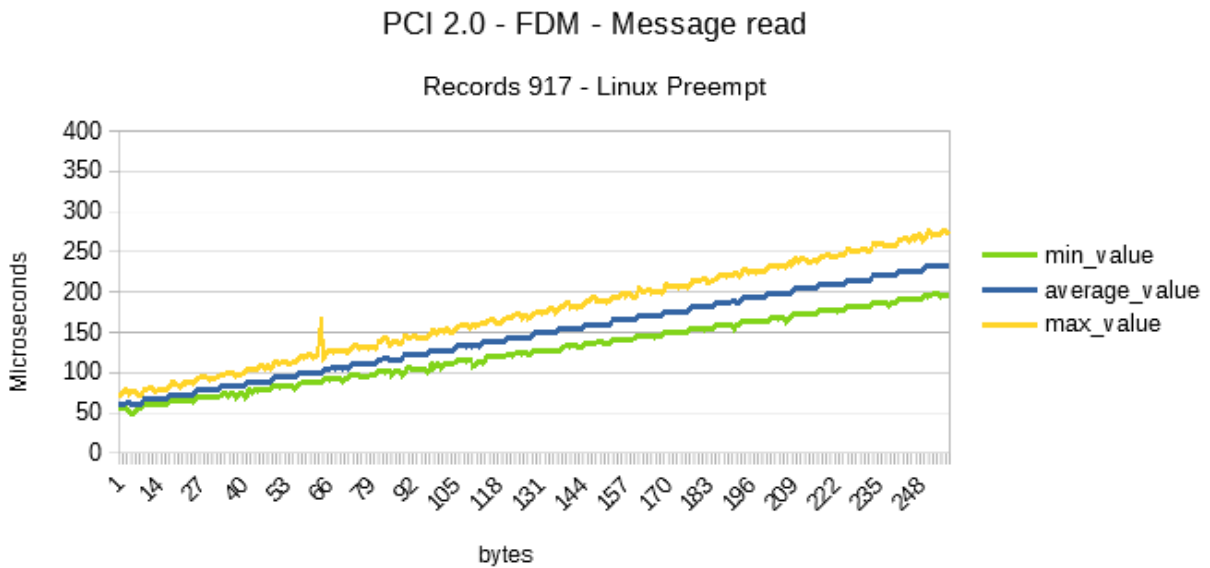
3.4.1. FIPCORE

FipCore function measurement: fipcore_read_msg



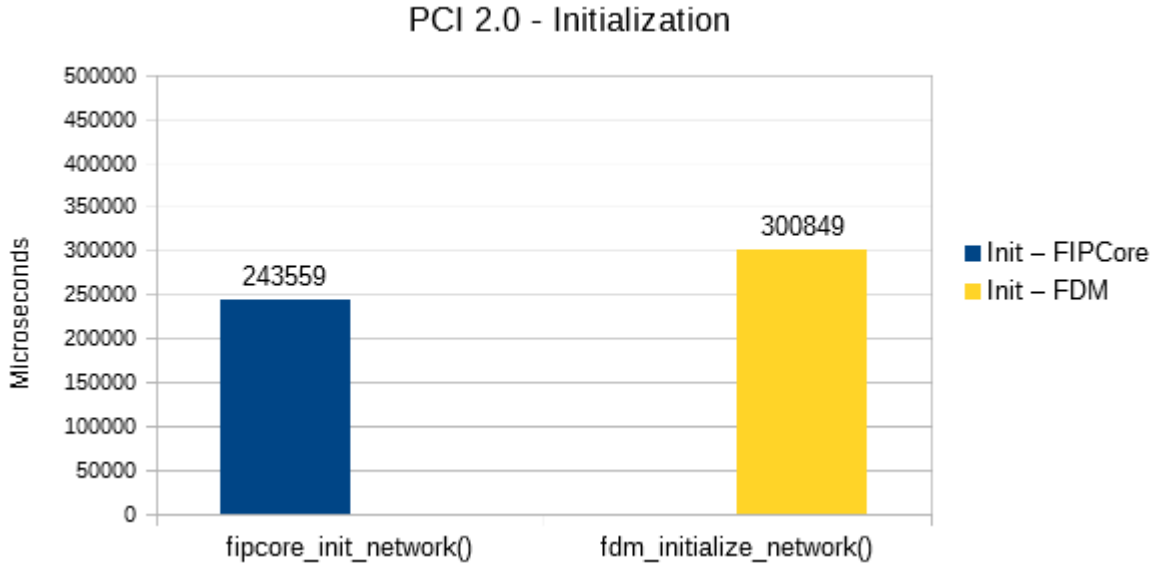
3.4.2. FDM

FDM function measurement : fdm_msg_rec_fifo_empty



3.5. NETWORK INITIALIZATION

FDM function measurement : `fdm_initialize_network`
FipCore function measurement: `fipcore_init_network`

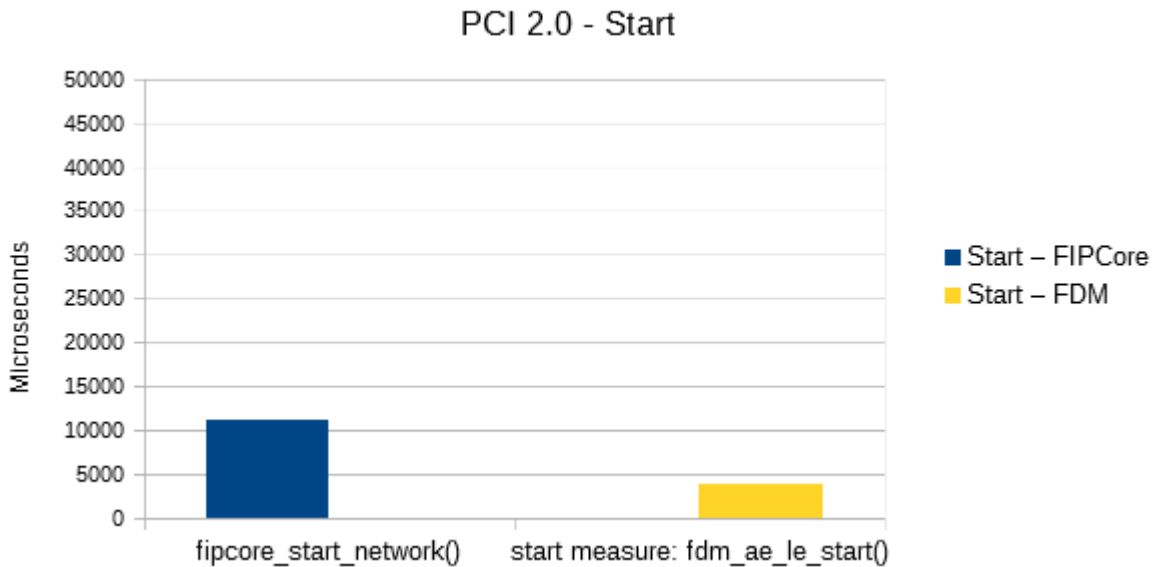


Test with RAM on start up.
Test with **250** variables

3.6. START NETWORK

FDM function measurement : `fdm_ae_le_start`
FipCore function measurement: `fipcore_start_network`

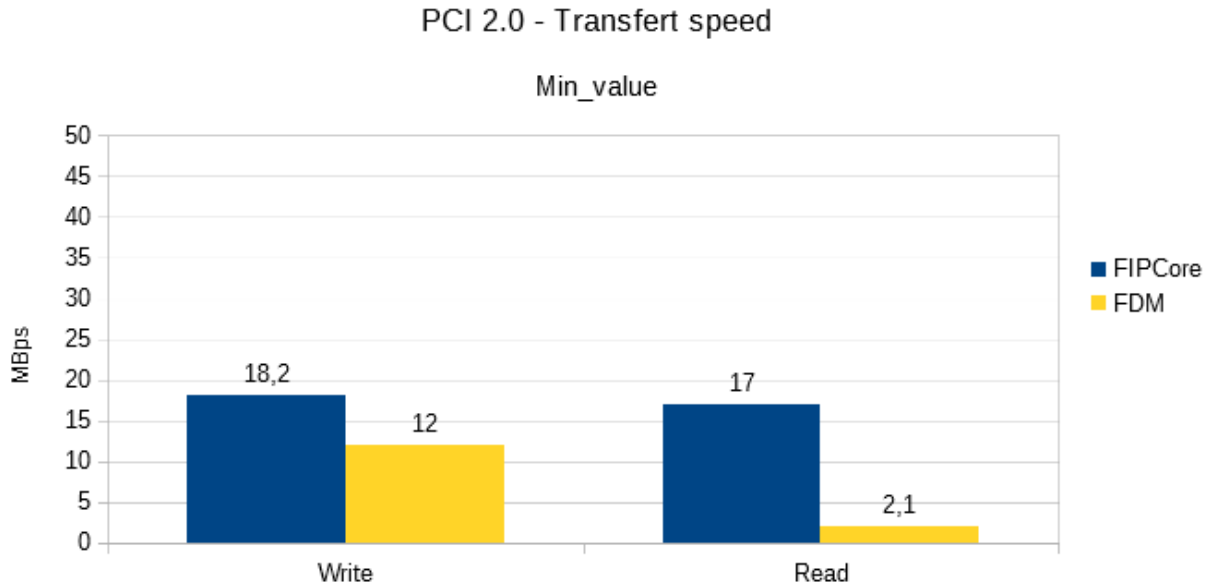
Test with **250** variables



4. TRANSFERT SPEED

Here we take the MIN times that best characterize the access time limits of the FIP card (card performance). AVG and MAX times are more closely related to the overall response of the system (Hardware Architecture, Operating System, etc.)

For information:



5. PCI FIP 2.00 CONVENTIONAL ACCESS

Conventional access (CA) is an old one, replaced by mode free access memory (FA) with more powerful results. For information see graphs below.

