APPLICATION NOTE

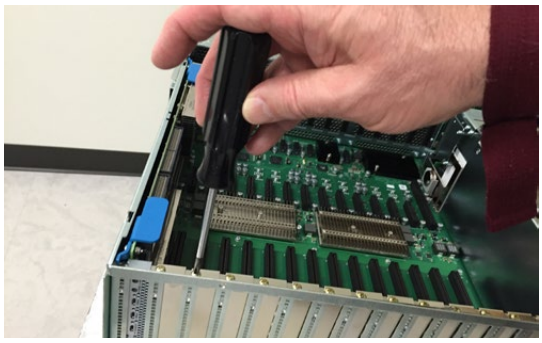
COMPUTING

So You Want to...

Install the Nvidia Quadro M4000 Video Card into the Artesyn MaxCore™ Platform?

Artesyn MaxCore™ Platform

Nvidia Quadro M4000 Video Card (front & back)



This document covers aspects of installing the Nvidia M4000 video card into Artesyn's MaxCore platform.

THE ARTESYN MAXCORE PLATFORM

The Artesyn MaxCore™ Platform is a flexible 3U NEBS-ready rack mount server with scalable x86 CPU performance in combination with many commerical off-the-shelf (COTS) PCI Express cards. The MaxCore platform enables customers to build economical and application-focused solutions. The versatile chassis holds up to 15 cards with a single CPU on server card (i.e., SharpServer™ card) dedicated to be the system host and 14 remaining slots to be used for either additional host processors or I/O cards. Connecting these platform components is a PCI Express based switch, which can be configured in multiple configurations. For this application note, the PCI Express based switch can be configured in either base or ExpressFabric mode.

For more details on the MaxCore platforms, visit the **Artesyn website**.

THE NVIDIA QUADRO M4000 VIDEO CARD

The Nvidia Quadro M4000 is a single slot width PCI Express based workstation video card featuring Nvidia's Maxwell GPU architecture. The card features 256 CUDA cores which can be used to process a broad range of professional design, animation and video applications. The M4000 video card integrates high performance computing with advanced visualization. When integrating multiple M4000 workstation video cards within the MaxCore platform, a powerful visual supercomputing platform is created.

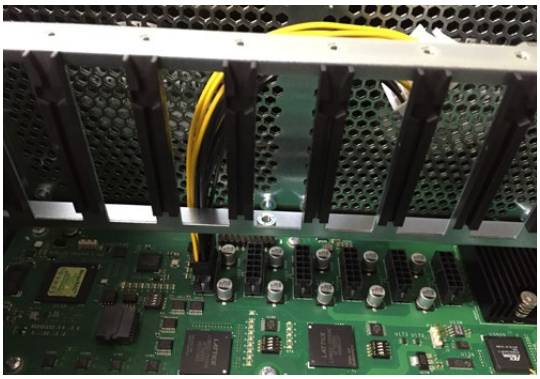
THE NVIDIA QUADRO M4000 HARDWARE INSTALLATION

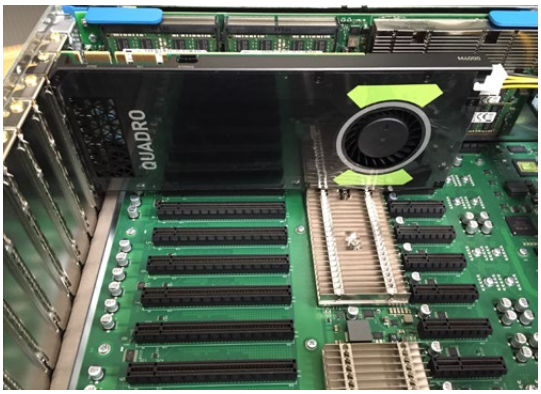
The MaxCore 3U platform can support up to 14 Nvidia Quadro M4000 video cards (3586 CUDA cores). These video cards could be installed in slots #2 through #15.

When installing the M4000(s), the auxiliary power cabling must be connected between each card(s) and auxiliary power connector(s) found on the MaxCore backplane. These auxiliary power connectors are located on the backplane adjacent to the system fans. Each power cable can support two video cards with each being provided a standard 6 pin 12V auxiliary power connector. Once power cabling is installed, unscrew the filler panel and install in available PCI Express slot(s). Once installation is complete, reinstall the screw onto the rear I/O panel to secure the board. See photos for reference.

NVIDIA

ARTESYN™ EMBEDDED TECHNOLOGIES





INSTALLING THE SOFTWARE PACKAGE

Software Installation Dependencies:

- SharpServer Management CPU (mCPU) and Application CPU (aCPU) are using BIOS 0.9.6 or higher
- Each server CPU is running CentOS 7.x
- mCPU is able to detect Nvidia card using lspci
- aCPU BIOS is set to “Ignore Option ROM”. Setting found in Video Setup Menu
- gcc, cpp, glibc-devel, glibc-headers, libmpc, mpfr and Xorg are installed on aCPU OS

To install the Nvidia card(s), the management CPU (mCPU) must assign the Nvidia card a to specific application CPU (aCPU). This can be done using mcc_tool.py found in /opt/bladeservices/bin folder. (ex: mccs_tool.py --method assign-func --cpu 1,2,1 --func 3,1,1). After the video card has been assigned the aCPU, the aCPU must be power cycled. Once aCPU is back up and running, the kernel and kernel headers on aCPU are updated to version supported by the Nvidia card. To complete the installation, a Nvidia provided script must be run to install the Nvidia software needed for runtimte. (ex: #sh NVIDIA-Linux-x86_64-352.55.run).

SYSTEM THERMAL OPERATION

The Artesyn MaxCore platform was designed with a thermal environment ready for high performance PCI Express I/O cards like the Nvidia M4000. The system fan setup is different than standard rack mount server designs as it pulls cool ambient air from the front of the chassis directly over the PCI Express cards. If you have any questions or issues installing the Nvidia Quadro M4000 in the MaxCore platform, please contact your local Artesyn Field Application Engineer (FAE).

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