



THE COMPACTFLASH ASSOCIATION ANNOUNCES CFexpress FAMILY

CFexpress Introduces a New Family of High-Performance Removable Media Based on PCIE® and NVM Express®

Cupertino, California – September 7, 2016 - The CompactFlash Association (CFA) announces the CFexpress Family of high-performance removable storage based on PCIE® and NVM Express®

CFA has developed high-performance removable cards standards for the last 21 years with the popular CompactFlash®, CFast®, and XQD® formats. The CompactFlash Association was formed in 1995 as the initial digital film format and continues to serve professional imaging and industrial markets where high performance and high-quality recording media is essential for high-speed capture and high-speed transfer into the workflow.

CFexpress is the next evolution in an open standard format for a broader set of applications, such as professional imaging, personal computing, servers, IoT and industrial. CFexpress differs from prior CFA standards in that CFexpress is a specification spanning multiple form factors and performance levels to match various market requirements while maintaining the same electrical/physical interface and memory/storage protocol. The new CFexpress specification is under development within the CFA CFexpress Working Group.

CFA's goals for the CFexpress family are:

- 1) **Unify the ecosystem** around a removable storage specification that has longevity in the market
- 2) Provide a **platform that scales** with performance increases in the PCIE® interface
- 3) **Leverages** the technologies and skillsets of the larger **volume compute markets**
- 4) Seamless **compatibility with the capture ecosystem and workflow** tools.

CFexpress leverages the PCIE® physical interface for higher performance based on the high-volume compute industry. PCIE® CFA's objective is to specify multiple removable storage devices that spans from two lanes architecture all the way up to eight lanes. With the current PCIE® Gen 3 delivering maximum theoretical interface speeds of 1.0GB/sec per lane, CFexpress would enable theoretical sequential speed of up to 8GB/s.

CFexpress also utilizes the low latency NVM Express® memory/storage protocol across all of the form factors. This enables compatibility with a broader set of ecosystem components, such as controllers, OS, capture devices and workflow modules. In imaging, compute and industrial applications, the use of PCIE® /NVM Express® enables access to wide range of open standard platforms consisting of mature and proven drivers. In addition, the new CFexpress format also enable easy compatibility with the Thunderbolt® interface which is also based on PCIE®. Actual CFexpress products will vary in performance based on market requirements and protocol overheads.

Professional video data rate requirements are growing at an exponential rate exceeding the capabilities of existing open standard formats. 4K RAW video at 30fps requires 400-500MB/sec of sustained performance not including any overhead to guarantee performance over the entire recording media. 4K RAW video at 120fps requires 1,600-2,000MB/sec. 4K RAW video at 240fps requires 3,200-4,000MB/sec. Even in High-Quality I-Frame compression formats, the data rates quickly exceed 1.0GB/Sec at high frame rates.

Key Feature

PCIE® Gen 3 Interface

Benefit

Provides a max theoretical interface speed of 1.0GB/sec per lane of PCIE®. This speed enhancement enables a new generation of higher performance cards to meet requirements for professional video recording.

Family of Form Factors

Provides multiple form factors to address multiple market segments with a unified physical interface and memory/storage protocol. 2 lane and 4 lane form factors will be the initial focus but anything from 1 lane to 8 lanes is possible. This provides a range of up to 8GB/Sec with PCIE® Gen3.

NVM Express®

A storage interface designed from the ground up for NVM storage. The NVM Express protocol features fixed length commands, an efficient queuing model, and very low non-cacheable PCIe accesses per command, delivering reduced I/O overhead and performance improvements in comparison to legacy storage device interfaces. NVM Express® is gaining popularity across various flash-based storage solutions and has driver support on all leading OSs.

Mr. Tom Ando of Canon and CFA Co-Chairman of the board said; “As the Co-Chairman of the CompactFlash Association I am pleased and excited to introduce CFexpress as CFA’s continues the tradition of performance leadership. The higher performance provided by CFexpress formats will further increase the capabilities and value for photographers, videographers, cinematographers, industrial, and compute applications. I am very pleased and proud to see the CFA creating standards that address new market requirements.”

Host and card manufacturers will be able to leverage the compute industry’s investment in PCIE® and NVM Express®. Media manufacturers will be able to leverage high volume solid state disk (SSD) controller technology to serve the high performance requirements of this market. The new format will have VPG (Video Performance Guarantee) capability with new VPG profiles at every increases performance levels. CFA’s goal for CFexpress is the development of a standard that can span many market segments and provide a stable and consistent format to fully leverage the industry’s R&D investments and less churn in the market of standardized and proprietary recording media formats.

Mr. Koichiro Kawamura of Nikon and CFA Co-Chairman of the board said; “As the Co-Chairman of the CompactFlash Association I am also pleased and excited to introduce CFexpress. The specification is a family of form factors that can serve many market segments with a unified physical interface and unified memory/storage protocol. We are excited with the vision that CFexpress will unify the imaging and industrial ecosystems around formats that are easily compatible with the computing markets. CFexpress represents a unique opportunity to unify the market around truly open standard formats.”

CFA invites host and media companies interested in supporting the new CFA specifications to also join CFA as members. Membership in the CompactFlash Association enables participation in CFA CFExpress Working Group and access to new specification before they are available for purchase by non-members. More information can be found at <http://www.compactflash.org>.

The CompactFlash®, VPG®, CFast® and CFexpress are trademarks of the CFA and are licensed royalty free to its members. PCIE® and Thunderbolt® are trademarks of Intel
XQD® is a trademark of Sony.
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