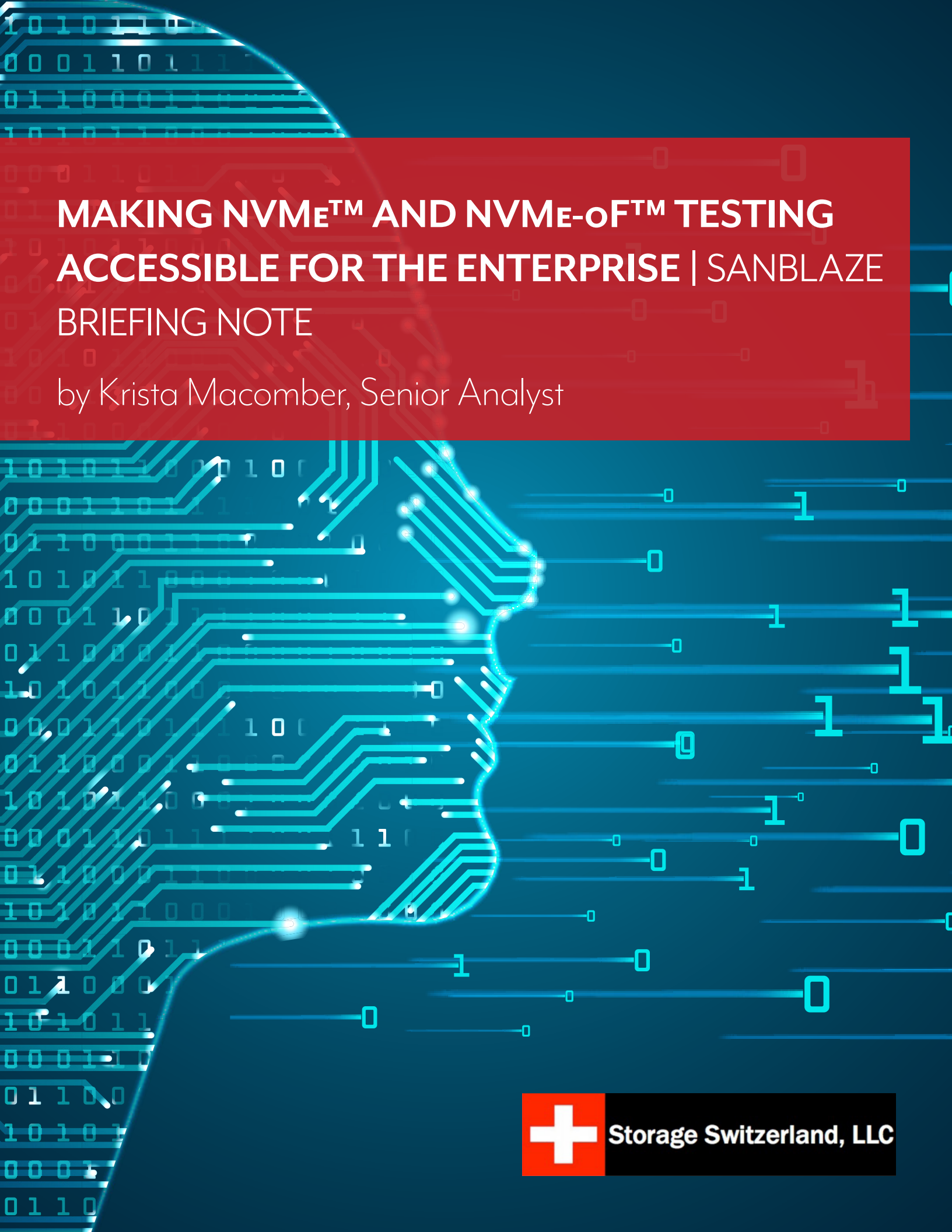

# MAKING NVMe™ AND NVMe-oF™ TESTING ACCESSIBLE FOR THE ENTERPRISE | SANBLAZE BRIEFING NOTE

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Non-volatile memory express (NVMe™) storage media and NVMe-over Fabrics (NVMe-oF™) storage network protocols open the door for new levels of performance and latency demanded by intensive, modern workloads such as big data analytics and artificial intelligence. However, the higher price and relative newness of these technologies require careful testing and validation on the part of storage array vendors – and on the part of enterprises, more extensive evaluations of cost-effectiveness, performance, and reliability to justify an investment.

## SANBLAZE NVME WORKLOAD TESTING WITH VIRTUAL INSTRUMENTS

Storage area network (SAN) emulation and validation provider SANBlaze has integrated support for NVMe running over any network protocol into its VirtuaLUN platform. SANBlaze primarily serves storage array vendors seeking granular testing and qualification of capabilities such as compression and deduplication, which have a significant impact on their systems' performance and capacity utilization – and thus are critical purchase criteria among NVMe storage array buyers.

VirtuaLUN offers a scriptable, custom command generator with a range of error conditions and triggers, for granular testing and qualification. Single or multiple hosts may be simulated through features such as read/write/compare testing. The platform also has traction with switch vendors; for example, product developers can emulate the impact to fabric login patterns.

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SANBlaze has allied with infrastructure performance management software vendor Virtual Instruments to enable modeling and analytics for workloads running on NVMe. The partnership will produce turnkey systems that allow VirtuaLUN to be controlled through Virtual Instruments' WorkloadWisdom workload performance validation software.

Whereas VirtuaLUN offers programmable yet complex parameter testing, WorkloadWisdom simulates complete workload environments, including load testing and analytics. For instance, WorkloadWisdom can simulate a virtual desktop infrastucture's (VDI) login storm, then record and playback the IO load to understand performance impact. Customers will receive the benefits of the increased granularity and NVMe support of VirtuaLUN, along with the less complex GUI and user experience of WorkloadWisdom. For example, the scope of parameters that may be customized is broad enough to be tailored to unique applications (I/O type, queue depth, data patterns, etc.), but multiple systems can be controlled from a centralized portal that use command line interfaces for ease of use.

Storage system engineers are drawn to VirtuaLUN's flexibility to simulate specific elements of the SAN environment for the purposes of product development, testing, and quality assurance. WorkloadWisdom's workload-centric focus simplifies this process, helping enterprises to better understand how to tier their workloads across their storage infrastructure based on performance, reliability and other requirements.

The new, joint solutions will support all mainstream storage technologies and protocols, including NVMe-over Fibre Channel and Ethernet, from a number of vendors including Broadcom, Cavium and Mellanox. Hardware configurations are flexible enough to be optimized in terms of CPU, memory, slots and ports per slot accordingly for maximum performance.

## STORAGE SWISS TAKE

When migrating to a new technology, it is always important for enterprises to ensure that performance, reliability and other key features or capabilities are there. While SANBlaze brings extensive testing and validation capabilities to storage array vendors building the new generation of NVMe appliances, the program is too complex for the average enterprise to use. As a result, the new SANBlaze-Virtual Instruments appliances are likely to resonate most with enterprises navigating the new "Tier 0" of ultra-fast but also expensive and potentially risky NVMe storage technologies, seeking to justify investment.

To learn more about evaluating the impact of NVMe on your data center, watch the Storage Switzerland, Virtual Instruments and SANBlaze playback of our live webinar, Does Your Data Center Need NVMe?

# ABOUT US

Storage Switzerland, LLC

Storage Switzerland is the leading storage analyst firm focused on the emerging storage categories of memory-based storage (Flash), Big Data, virtualization, and cloud computing. The firm is widely recognized for its blogs, white papers and videos on current approaches such as all-flash arrays, deduplication, SSD's, software-defined storage, backup appliances and storage networking. The name "Storage Switzerland" indicates a pledge to provide neutral analysis of the storage marketplace, rather than focusing on a single vendor approach.

SANBlaze

SANBlaze Technology, Inc. is a pioneer in storage emulation technologies and a leading provider of storage, networking and multifunction solutions for embedded systems. SANBlaze emulation systems are deployed in the test and development labs of most major storage hardware and software vendors worldwide. SANBlaze embedded computing products include a complete line of AdvancedTCA® and AMC board level solutions, as well as preconfigured and integrated systems solutions. These products are deployed into telecom and defense applications.

SANBlaze Technology, Inc. is revolutionizing the SAN and Device Driver markets by offering NVMe testing end-to-end. They are first to market a solution that tests Native NVMe and NVMe over Fabrics (NVMe-oF™) for complete end-to-end testing of your entire system using single port or dual port drives.

George Crump is the founder of Storage Switzerland, the leading storage analyst firm focused on the subjects of big data, solid state storage, virtualization, cloud computing and data protection. He is widely recognized for his articles, white papers, and videos on such current approaches as all-flash arrays, deduplication, SSDs, software-defined storage, backup appliances, and storage networking. He has over 25 years of experience designing storage solutions for data centers across the U.S.