

TOSHIBA

MAGUAY
KNOWLEDGE AS A SERVICE

**NO TIME FOR
DOWNTIME**

Performance of SSD and HDD based RAID Architectures – Live Demo Benchmark

Rainer Kaese, Senior Manager, HDD Business Development

Toshiba Electronics Europe GmbH

September 2019

• **Live Demo Session**

- Remote on Toshiba's demoserver/storage equipment in the "Innovation-Lab" of "e-shelter", the largest European co-location datacentre in Frankfurt, Germany
- Comparing different single storage components (HDD, SSD) performance under different workloads
- Comparing different local RAID sets of storage components (HDD, SSD) under different workloads
 - Database, virtual storage, email storage, archiving, video streaming etc.

Live Performance Benchmark Setup



e-shelter

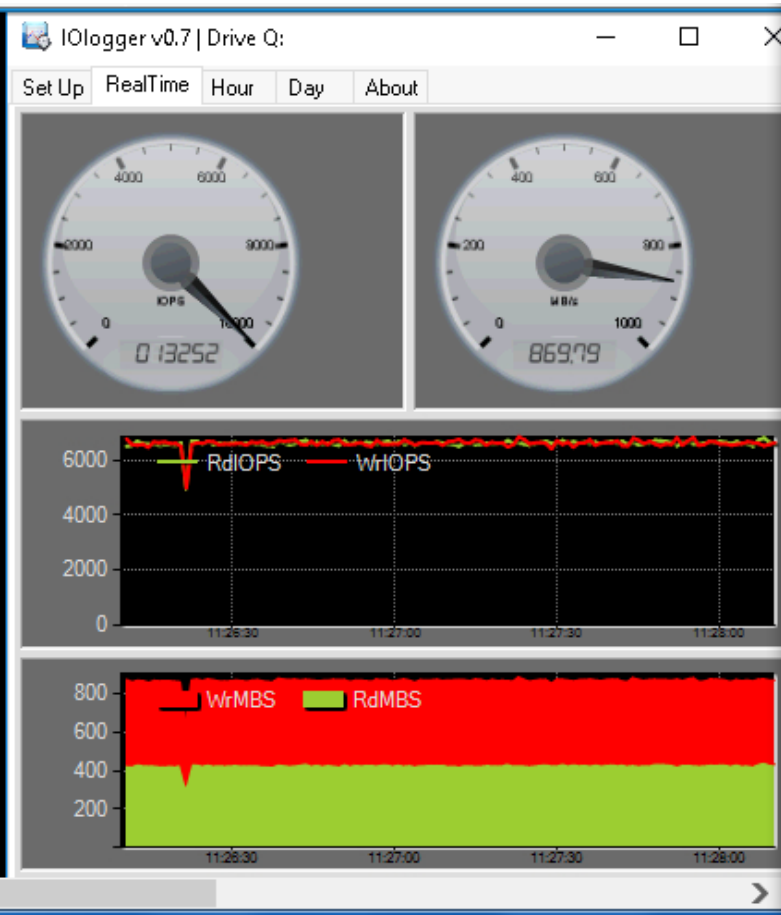
Co-location Datacenter
Frankfurt/Germany
Innovation Lab



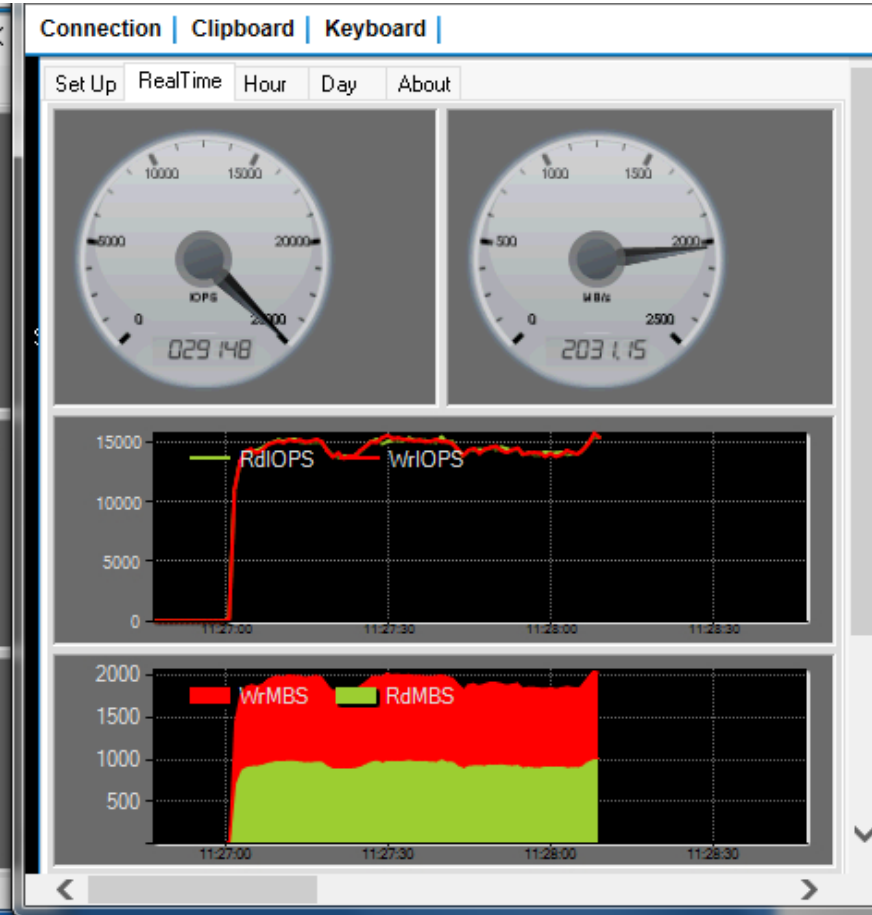
Live Performance Benchmark – Single Drives



Single HDD Volume
MG08SCA16TE

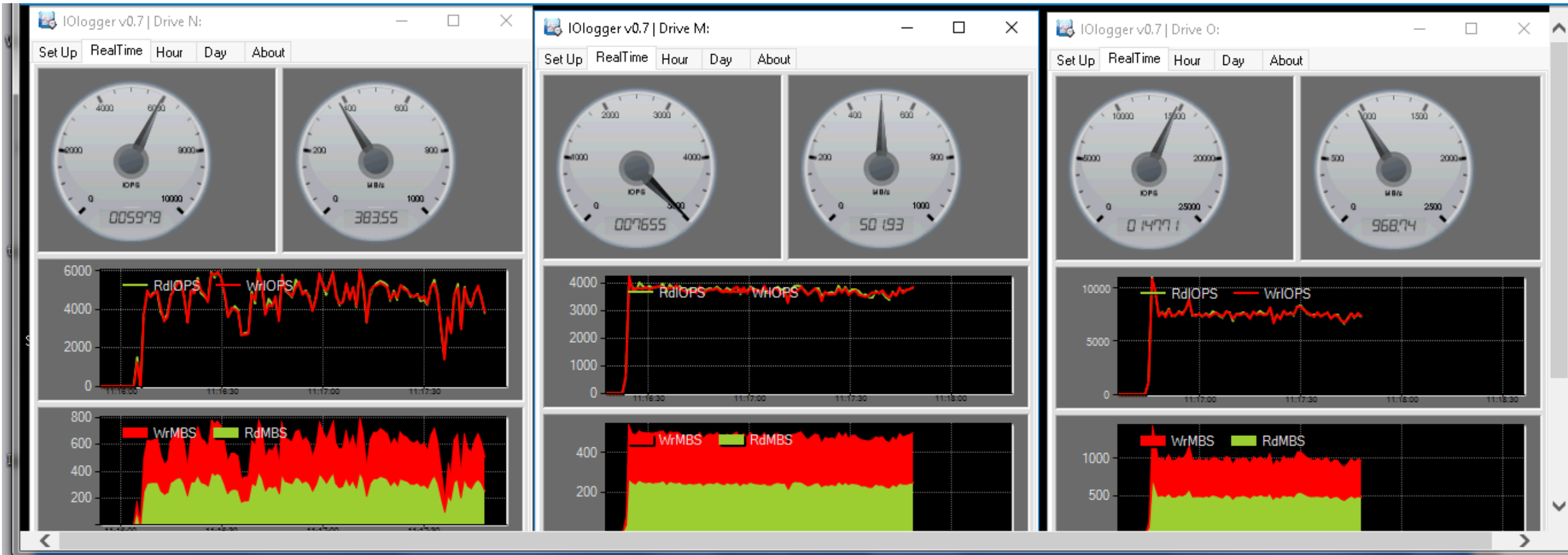


Single SAS SSD Volume



Single NVMe SSD Volume

Live Performance Benchmark – RAID Arrays



Equal Investment for Storage Sub-System

Benchmark for 64k Random read/write (Mixed Workload)

**8x eSSD 1.6TB 3DWDP
RAID6 10TB**

**24x 10krpm 2.5" 2.4TB HDD
RAID10 30TB**

**60x 7.2krpm 3.5" 2TB HDD
RAID10 60TB**

TOSHIBA

Thank you.



Legal Disclaimer

The information contained herein is subject to change without notice. The information contained herein is presented only as a guide for the applications and products. No responsibility is assumed by Toshiba for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Toshiba or others. Toshiba is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It's the responsibility of the buyer, when utilizing Toshiba products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such Toshiba products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that Toshiba products are used within specified operating ranges as set forth in the most recent Toshiba product specifications. Also, please keep in mind the precautions and conditions set forth in the „Handling guide for Semiconductor devices“, or the „Toshiba Semiconductor Reliability Handbook“, etc.. The Toshiba products listed in this document are intended for usage in general electronic applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances etc.). These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinary high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury („Unintended usage“). Unintended usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices etc... Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk. The products described in this document may include products subject to the foreign exchange and foreign trade laws. Toshiba does not take any responsibility for incidental damage (including loss of business profit, business interruption, loss of business information, and other pecuniary damage) arising out of the use or disability to use the product.