



# Industry Analysis and Lab Testing Services

June 2013



# Agenda

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- ◆ Company Background
- ◆ Public & Private Services
- ◆ SNIA Emerald Test Configuration
- ◆ Free Resources

This video is available on the Demartek YouTube Channel [www.youtube.com/Demartek](http://www.youtube.com/Demartek)

# Company Background

- ◆ Formed in 2004 with part-time operations
- ◆ Began full-time operations September 2006
- ◆ June 2013: 7 Employees (full-time and part-time)
- ◆ On-site test lab (servers, networking, storage)
- ◆ Registered trademark: Demartek
- ◆ Privately held, self-funded
- ◆ Website: [www.demartek.com](http://www.demartek.com)

# Public Services

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- ◆ Ease of Use Studies
- ◆ Deployment Guides and Solutions Guides
- ◆ Lab Validation Testing and Reporting
- ◆ Performance Testing and Reporting
- ◆ Competitive Testing and White Papers
- ◆ Electrical Power Measurement
- ◆ Results published on [www.demartek.com](http://www.demartek.com) and sponsoring company website

# **Private Services**

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- ◆ **Beta and other Pre-GA testing**
- ◆ **Testing and Analysis of possible acquisition or joint venture company products**
- ◆ **Private Competitive Testing**
- ◆ **Results not published and given only to sponsoring company**

# **Areas of Expertise**

- ◆ **Storage**
  - ◆ Fibre Channel, FCoE, iSCSI, SAS, SATA, PCIe, Infiniband
  - ◆ SSD technology, including SSD caching and tiering
  - ◆ Storage Management Software
- ◆ **Virtualization (Server, Storage and I/O)**
- ◆ **Networking (1Gbe, 10GbE, Management)**
- ◆ **Microsoft Applications and Solutions**
  - ◆ Exchange Server, SQL Server, SharePoint
- ◆ **Operating Environments**
  - ◆ Windows, Linux, Solaris, VMware, Hyper-V, Xen

# Demartek Lab Resources

## ◆ Servers

- ◆ PCIe 3.0, 2.0 and 1.0, up to 32 logical processors
- ◆ Large RAM, up to 192GB
- ◆ Many front drive bays

## ◆ Networking

- ◆ Ethernet: 1 GbE and 10 GbE
- ◆ Fibre Channel: 16 Gb, 8 Gb, 4 Gb

## ◆ Storage

- ◆ Every interface: FC, FCoE, IB, iSCSI, PCIe, SAS, SATA, USB
- ◆ Internal HDDs and SSDs
- ◆ External storage arrays (DAS, NAS & SAN): HDD and all-flash



# Performance Tests

## ◆ Synthetic

- ◆ IOmeter (2006, 2008, 2010), VDBench, FIO, Phoronix, SQLIO
- ◆ [www.demartek.com/Demartek\\_Benchmark\\_Output\\_File\\_Formats.html](http://www.demartek.com/Demartek_Benchmark_Output_File_Formats.html)

## ◆ Database

- ◆ Hammerora (TPC-C, TPC-H), Percona (TPC-C), TPC-E (Microsoft), SQLIOSim, SQL Server custom data

## ◆ Email

- ◆ Microsoft ESRP (JetStress), Microsoft LoadGen, self-developed email server message generator

## ◆ File

- ◆ FileBench, ROBOCOPY scripts (custom data)

## ◆ Web server

## ◆ Custom data sets for application workloads

# **Initiatives for 2013**

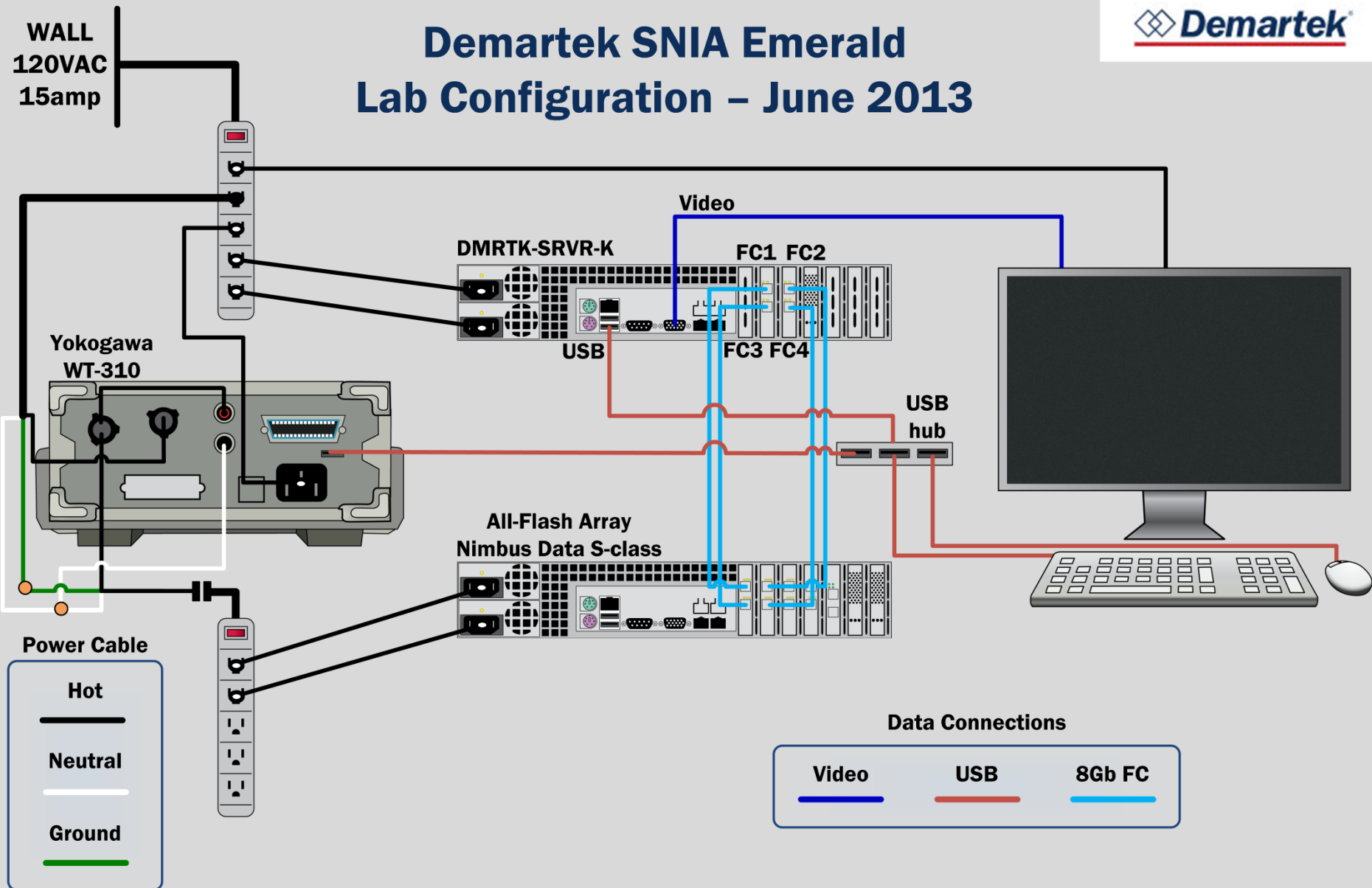
- ◆ **SSDs (primary and caching) and their impacts on:**
  - ◆ **Controllers, Applications, Networking**
- ◆ **Server virtualization, application and storage interaction**
- ◆ **I/O Virtualization (NPIV, SR-IOV, MR-IOV, etc.)**
- ◆ **Updated interfaces**
  - ◆ **SAS 12G/6G, SATA 6G, USB 3.0, PCIe 2.0/3.0, 10GbE, 16GFC, others**
- ◆ **Software validation testing, including applications**
- ◆ **SNIA Emerald Testing**
- ◆ **Deployment Guides: SSD, iSCSI, 16GFC & others**



SNIA Emerald™

Green Storage Initiative

# Demartek SNIA Emerald Lab Configuration – June 2013



# Test Configuration Specs

- ◆ **Server: DMRTK-SRVR-K (Analyzer & VDbench)**
  - ◆ Supermicro X9SCM-F
  - ◆ Intel Xeon E3-1280, 3.5 GHz, 4 cores, 8 logical processors
  - ◆ 32 GB RAM
  - ◆ Boot drive: SSD
  - ◆ Windows Server 2012
- ◆ **Storage System: Nimbus Data S-Class**
  - ◆ 24 SSDs, 2.4 TB raw capacity
- ◆ **Power Meter: Yokagawa WT-310**
  - ◆ WT-300 series is the successor to the WT-200 series

# VDbench Parameters

rd1\_hband: elapsed=5m,interval=5,pause=30,th=4

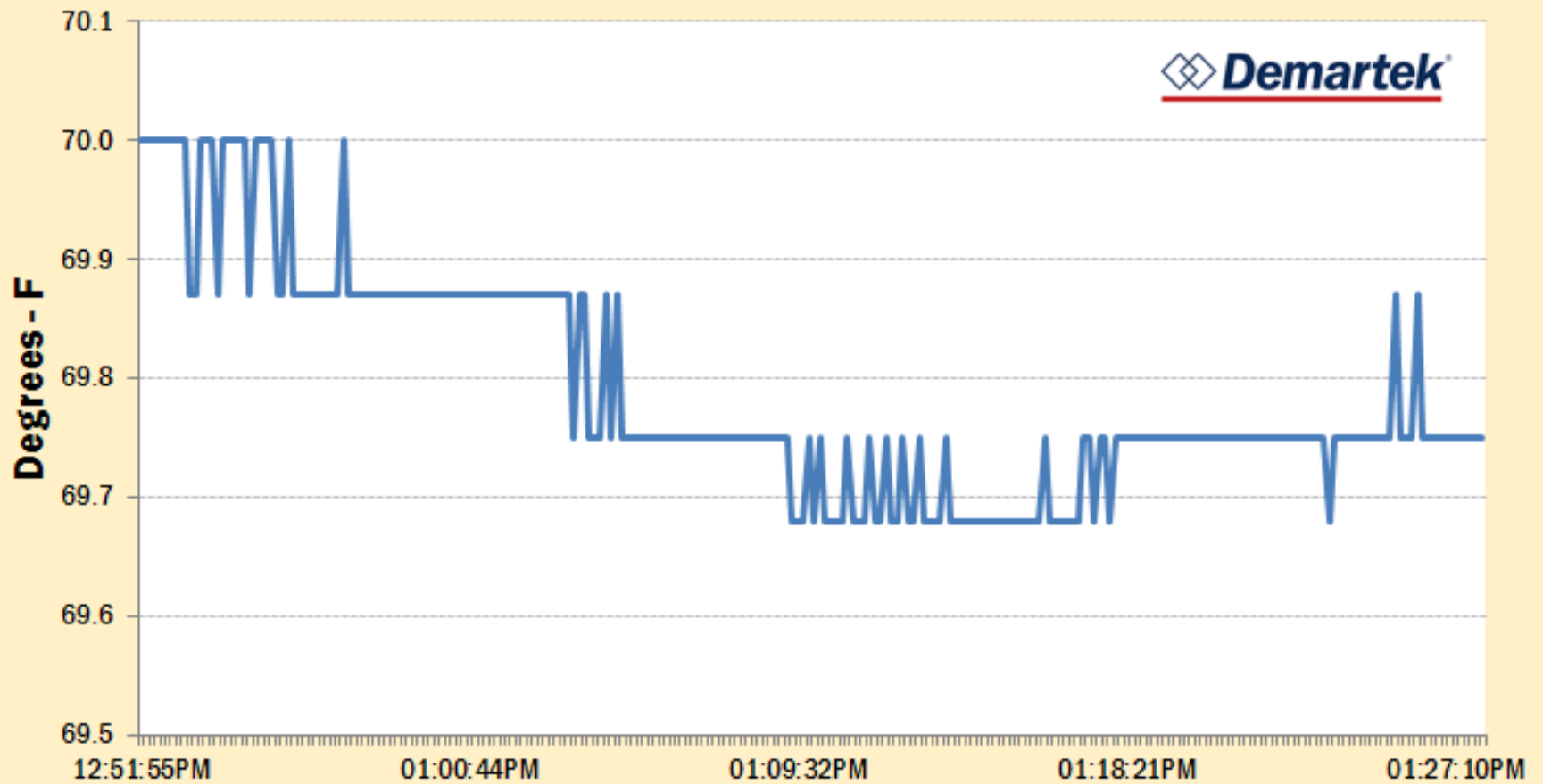
rd1\_mixed100: a elapsed=5m,interval=5,xfersize=8k,th=100

rd1\_mixed100: elapsed=5m,interval=5,xfersize=8k,th=100

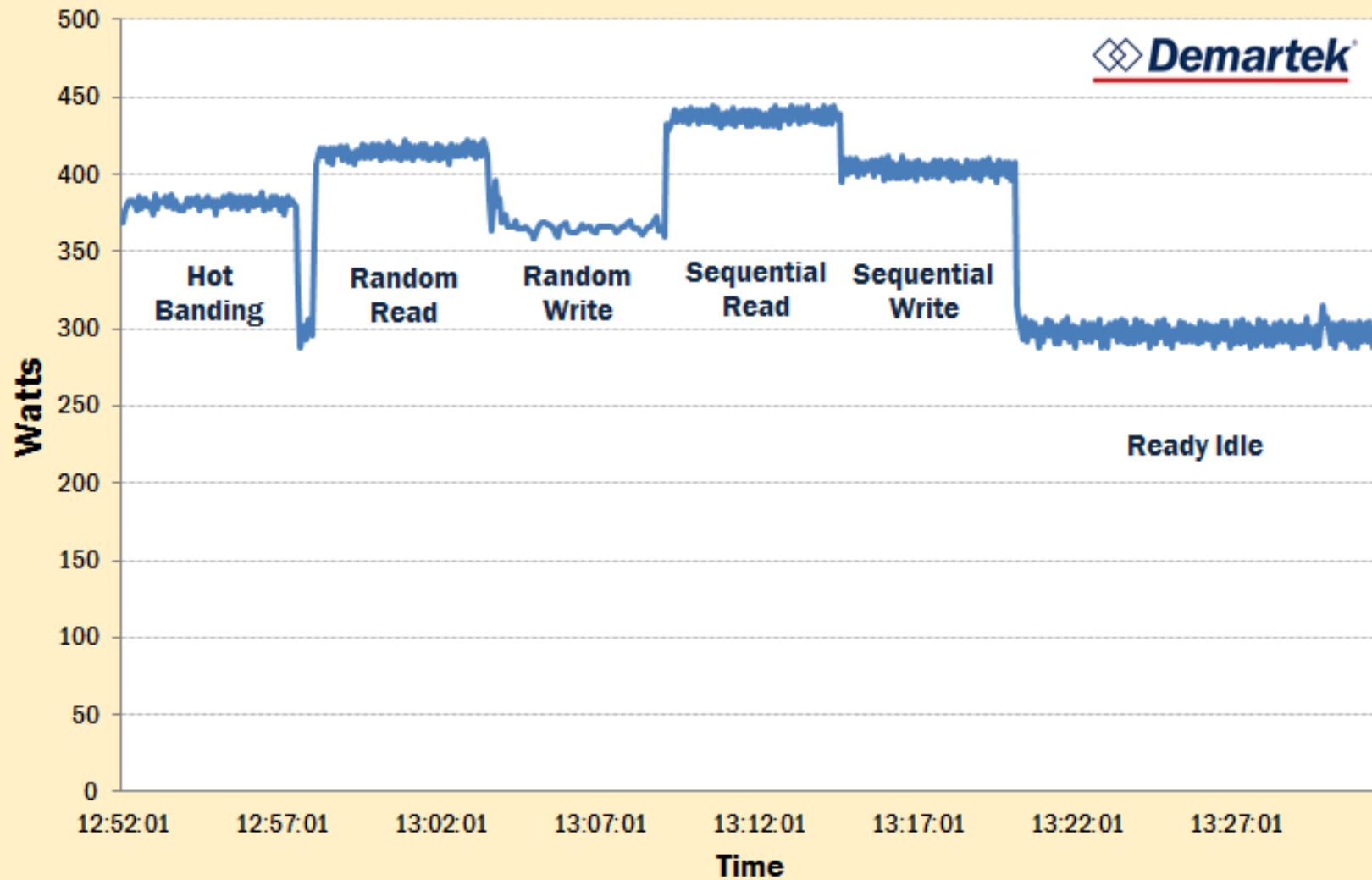
rd1\_seq: elapsed=5m, xfersize=256K,th=100

Note: these are **NOT** the elapsed time settings as described in the official specifications, but these allowed me to adjust the thread counts to help in achieving the “Best Foot Forward” (BFF) configuration.

## Ambient Temperature

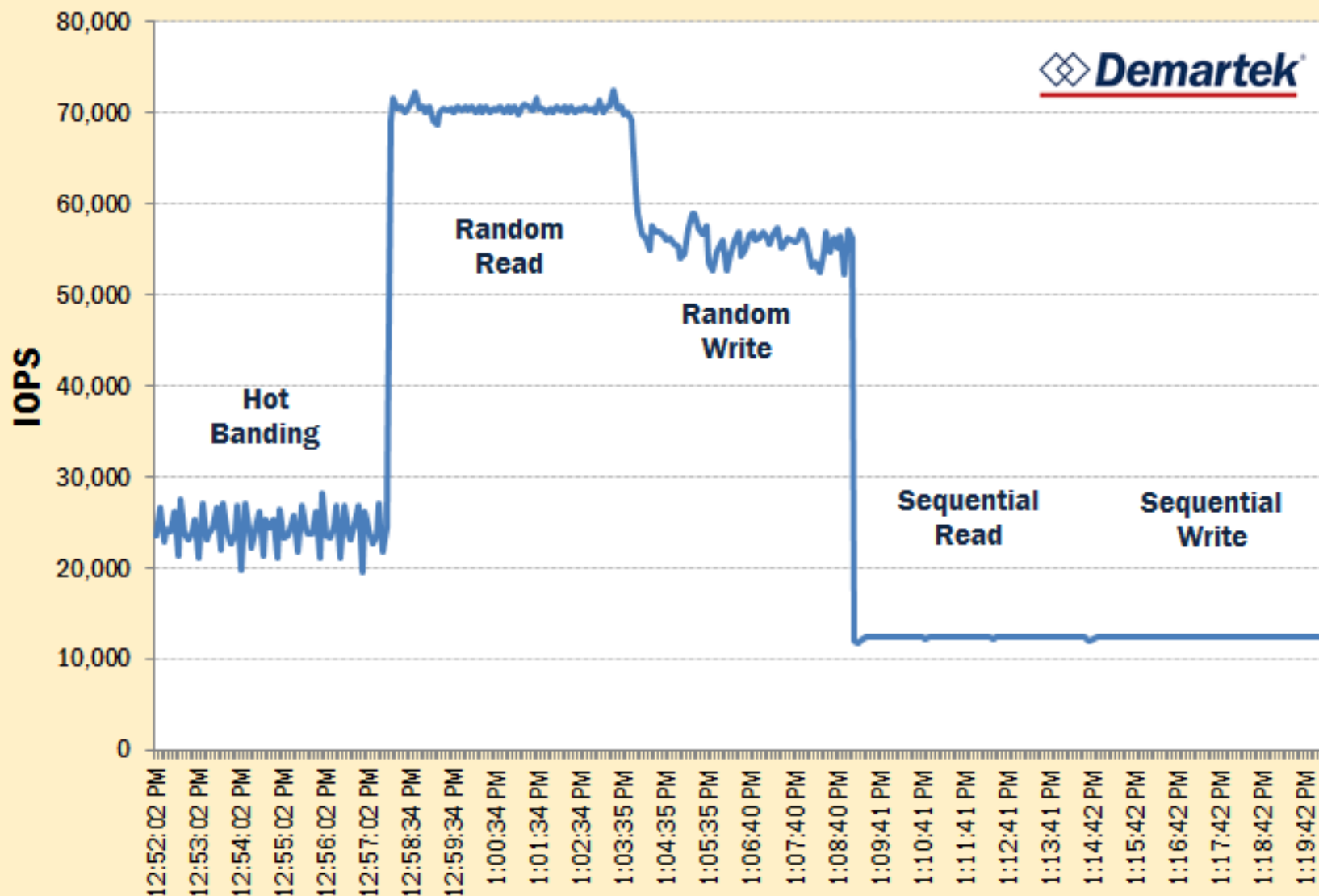


## Power Usage

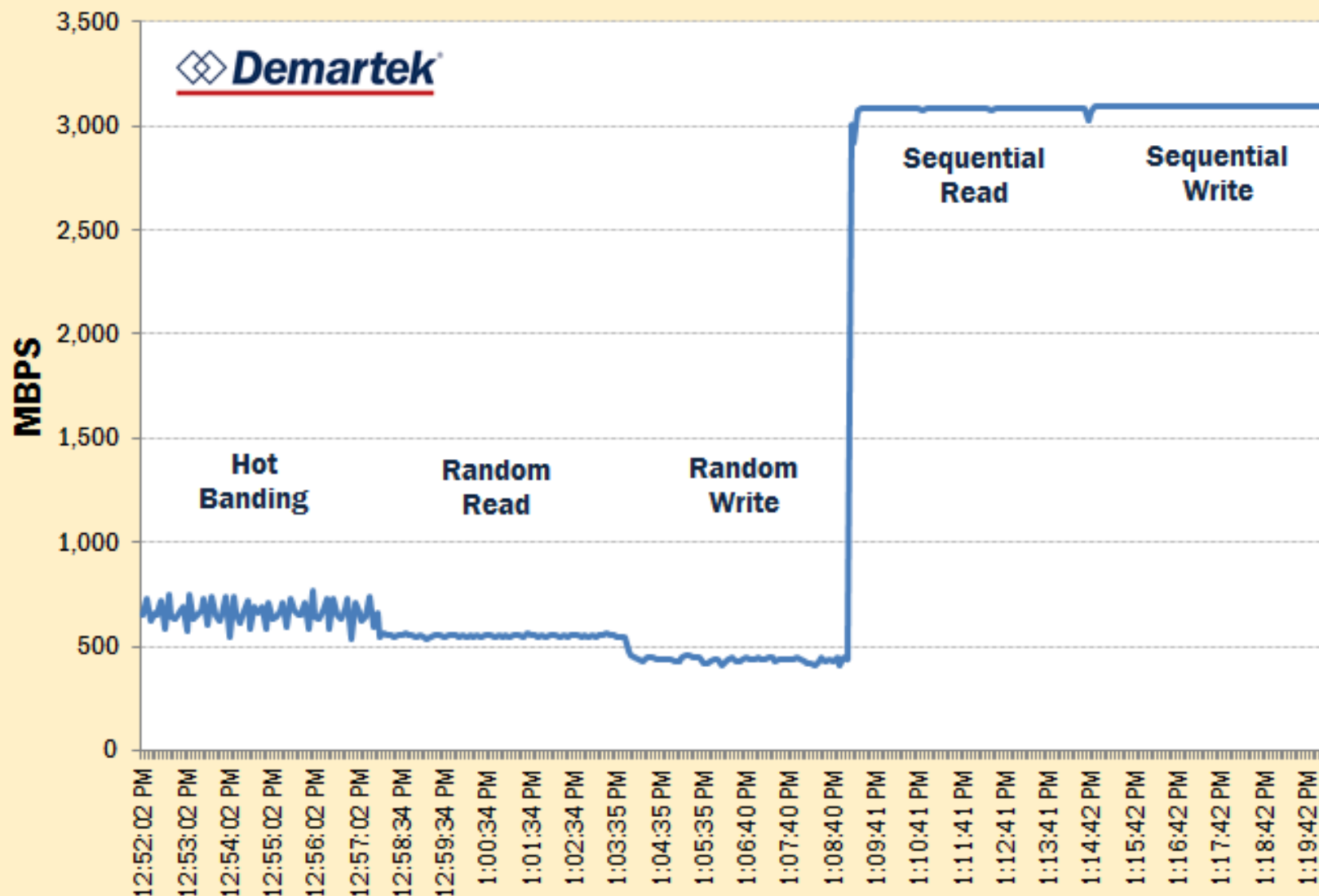




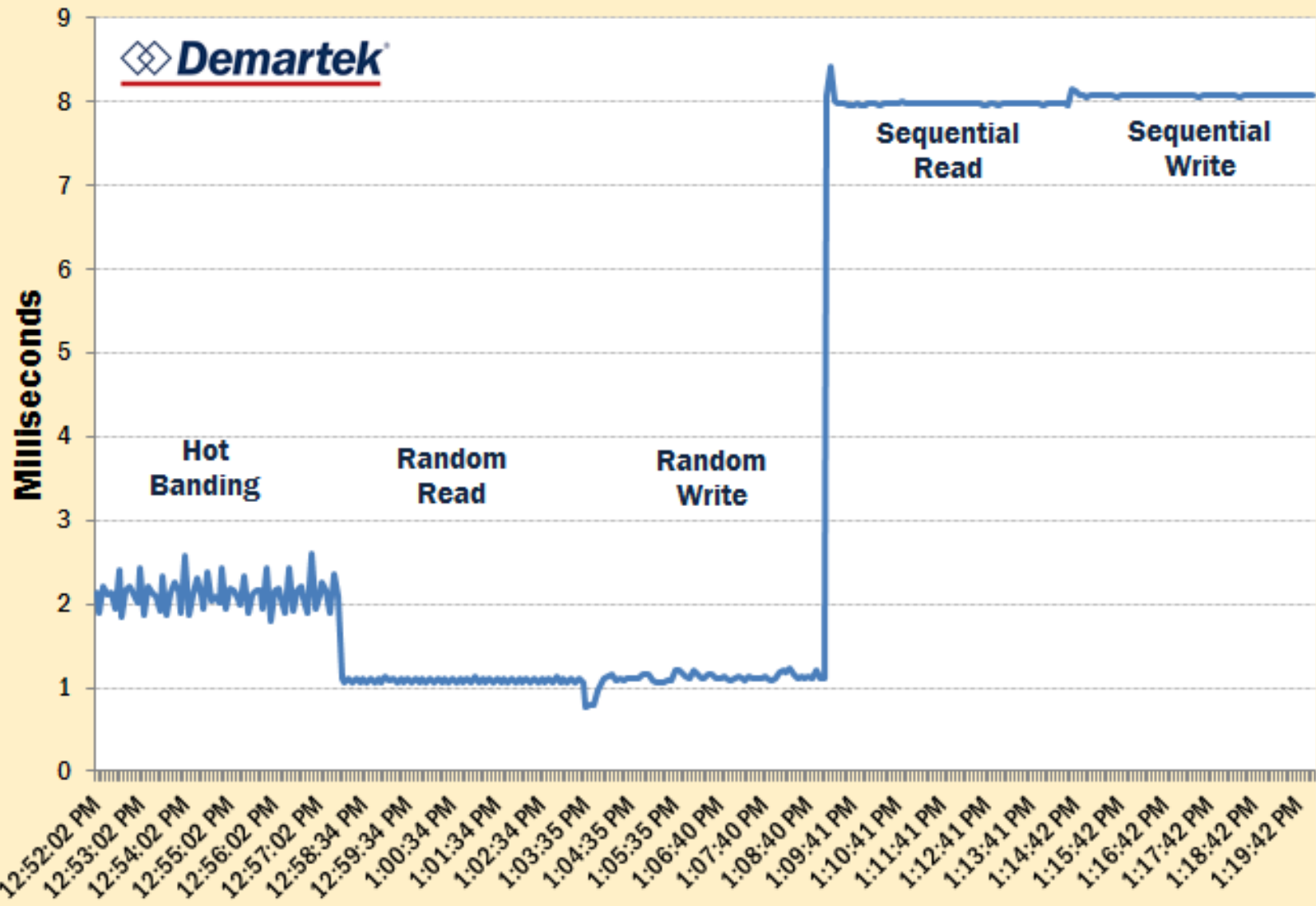
# IOPS



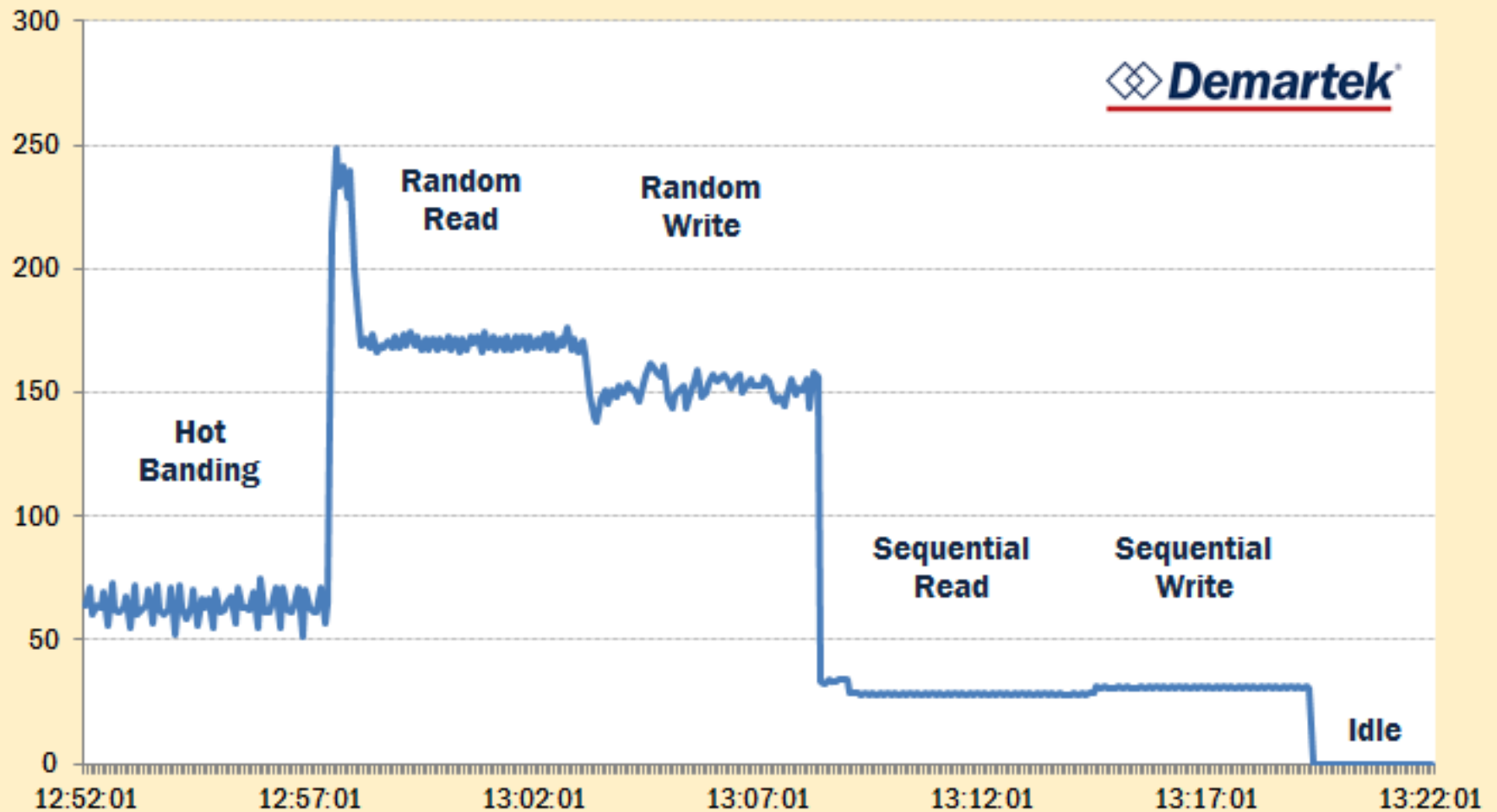
# MBPS



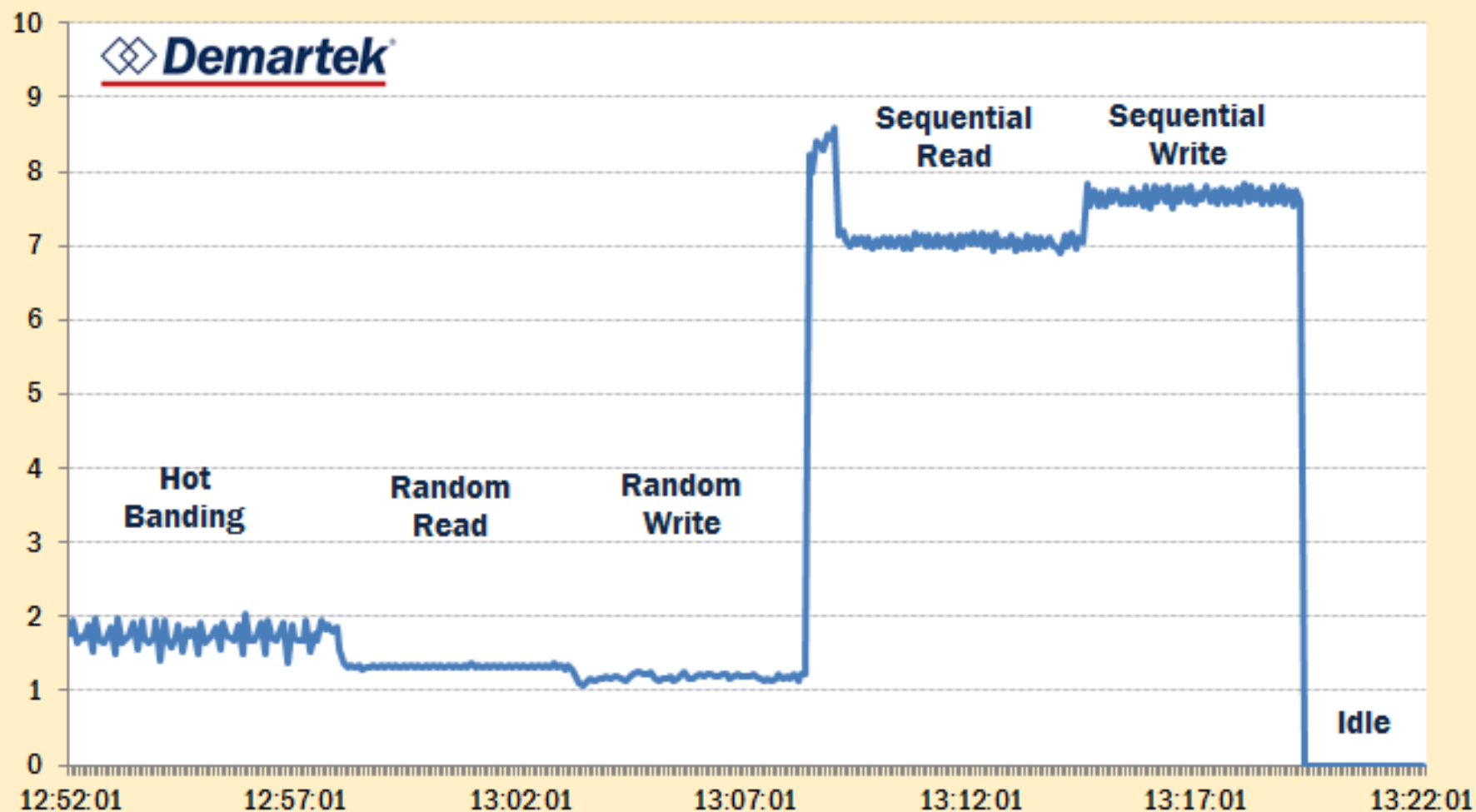
## Response Time



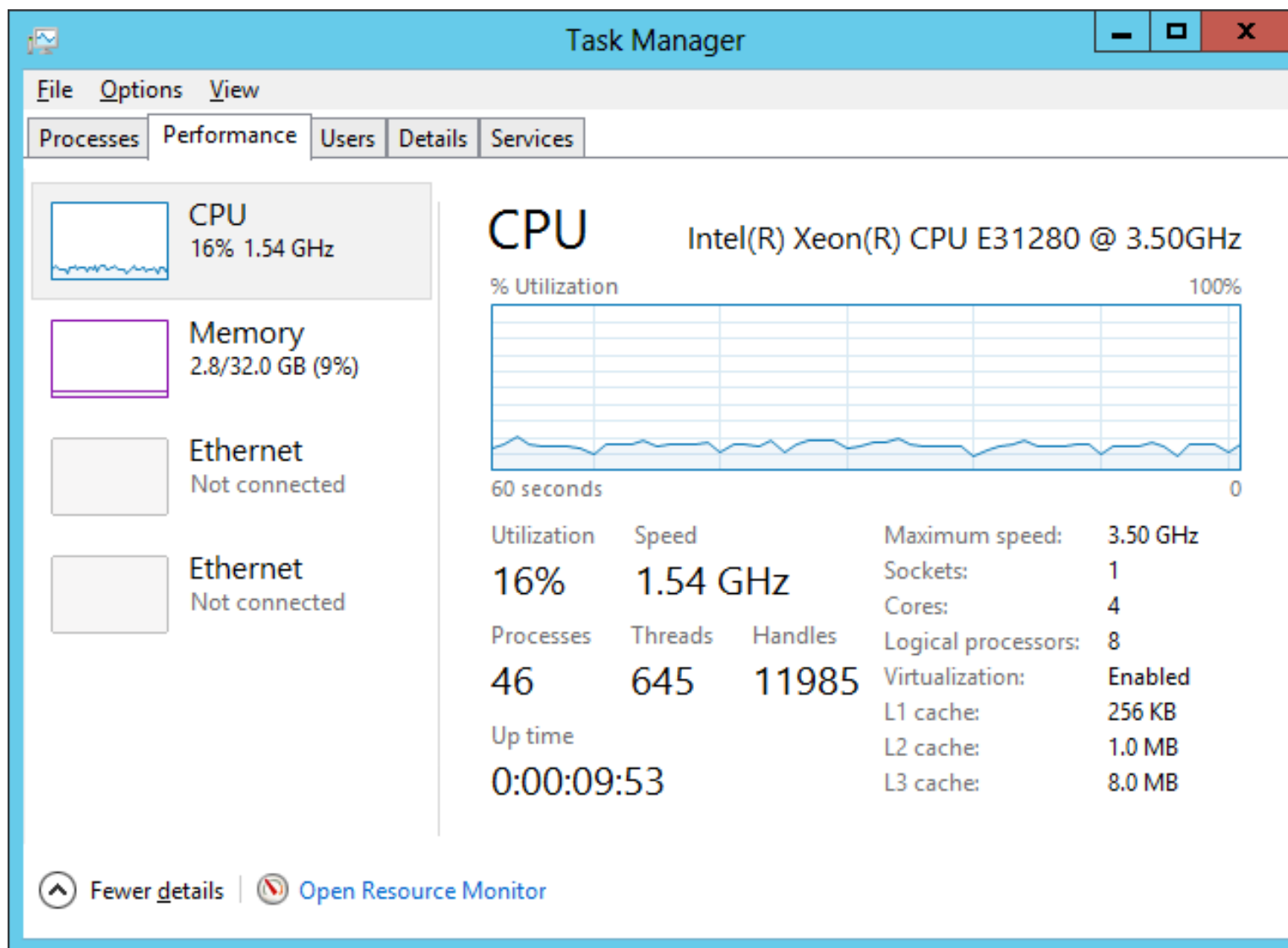
## IOPS/Watt



## MBPS/Watt



# CPU Utilization during Hot Banding Test



# **Demartek Resources**

- ◆ Demartek Zones: FC, FCoE, iSCSI, SSD
- ◆ YouTube Channel  
[www.youtube.com/Demartek](http://www.youtube.com/Demartek)
- ◆ Demartek Free Monthly Newsletter  
[www.demartek.com/Newsletter](http://www.demartek.com/Newsletter)





## Contents

- ◆ Acronyms
- ◆ Storage Networking Interface Comparison Table
- ◆ Transfer Rate, Bits vs. Bytes, and Encoding Schemes
- ◆ History
- ◆ Roadmaps
- ◆ Cables: Fiber Optics and Copper
- ◆ Connector Types
- ◆ PCI Express® (PCIe®)

- ◆ [www.demartek.com/Demartek\\_Interface\\_Comparison.html](http://www.demartek.com/Demartek_Interface_Comparison.html)
- ◆ Search for “storage interface comparison” in your favorite search engine



# Contact Us

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Skype: Demartek

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- ◆ Download the Aurasma App (Android/iPhone)
- ◆ Search and follow “Demartek”
- ◆ View image below with viewfinder.



\*also on the back of Dennis' business card

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