

Дисковые полки Western Digital для архива видеонаблюдения. Просто, надёжно, эффективно

15 октября 2020 г.

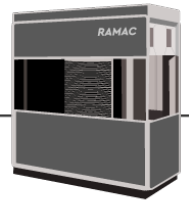
Western Digital.
© 2020 Western Digital Corporation or its affiliates. All rights reserved.


HGST
a Western Digital brand


WD
a Western Digital brand


SanDisk®
a Western Digital brand

History of Foundational Innovation



1956
Invented first hard drive (RAMAC)
IBM



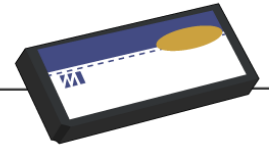
1976
First disk array sub-system patent
WD

SunDisk

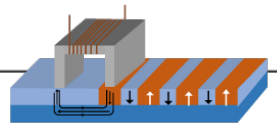
1988
Introduces flash as storage medium
SunDisk*
*SunDisk was later renamed to SanDisk



1991
Introduces MR heads
IBM



1995
First flash drive
M-Systems



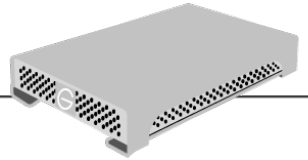
1998
Introduces industry standard PMR
IBM



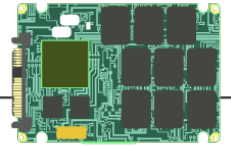
2013
First helium HDD (6TB)
HGST



2009
First 64GB x4 flash memory
SanDisk



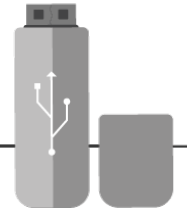
2007
First 500GB 2.5" portable external HDD
G-Technology



2007
Introduces SSDs into computers
SanDisk

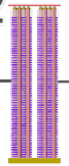


2000
First MLC NAND
SanDisk



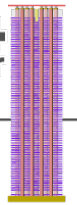
2000
First USB flash drive
IBM & M-Systems

48 Layer



2015
First 48-layer 3D NAND technology
SanDisk

64 Layer



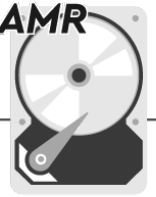
2016
First 64-layer 3D NAND technology
SanDisk

96 Layer



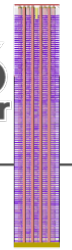
2017
First 96-layer 3D NAND technology
SanDisk

MAMR



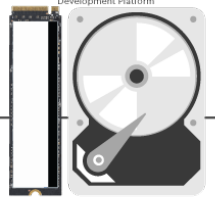
2018
Introduces EAMR* technology
Western Digital
*EAMR=Energy Assisted Magnetic Recording

96 Layer



2018
Introduces 96 layer QLC NAND
Western Digital

Zoned Storage
Development Platform



2019
Introduces Zoned Storage
Western Digital

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Broadest Storage Leadership



NAND Components



Embedded NAND



NVMe-over-Fabric (NVMeOF) Bridge ASIC



Cards



USB



Portable Storage



Enterprise HDD



Client SSD



Client+ HDD



Network Attached Storage & Personal Cloud



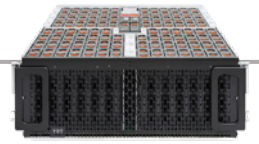
Direct-Attached Storage



Enterprise SSD



Memory Extension Drive



JBOD & JBOF



Storage Servers



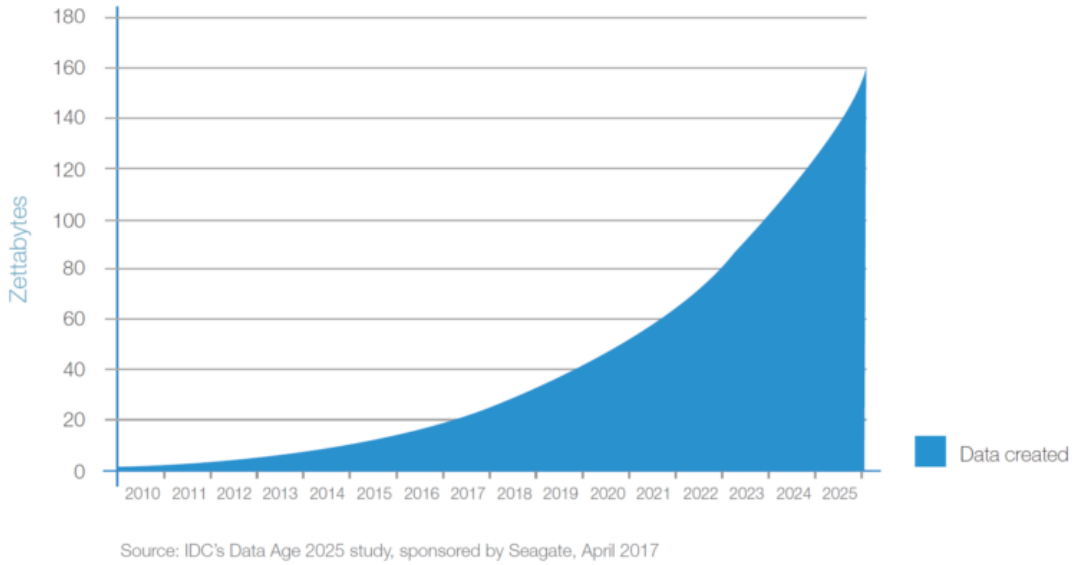
NVMe-over-Fabric (NVMeOF) Bridge Adapter



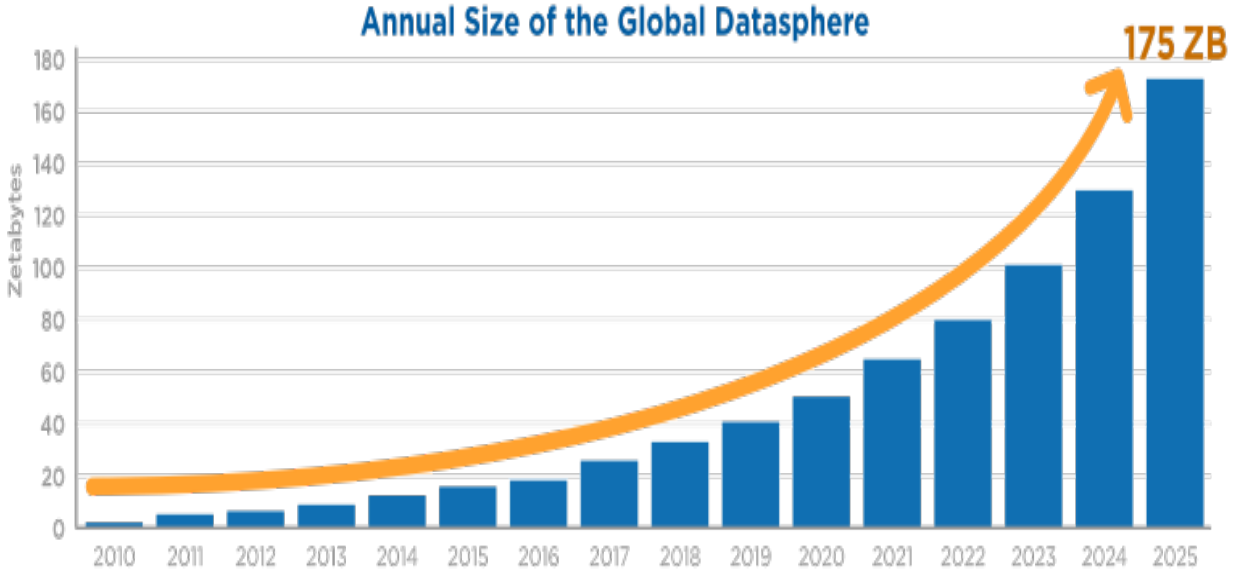
OpenFlex™ NVMe-over-Fabric Storage

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Рост создаваемых данных



Source: IDC's Data Age 2025 study, sponsored by Seagate, April 2017



Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018

- В 2018 объем создаваемых данных в мире – 33 ZB
- Прогнозы становятся менее консервативными → 175 ZB к 2025
- С 2018 по 2025 ожидается поставка на рынок 22 ZB емкости хранения
- Ожидается восстановление позиций enterprise/cloud

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Когда умрет HDD?



© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Жесткий диск умер, да здравствует SSD ?

- Нет, но ХОРОШИЙ вопрос!
- Немного уважения старику харду – он по-прежнему самая точная машина на свете. Задумайтесь…
- Он не самый модный и современный, но проверенный, крепкий и надежный. Как Терминатор T-800.



SSD
60 EB/yr

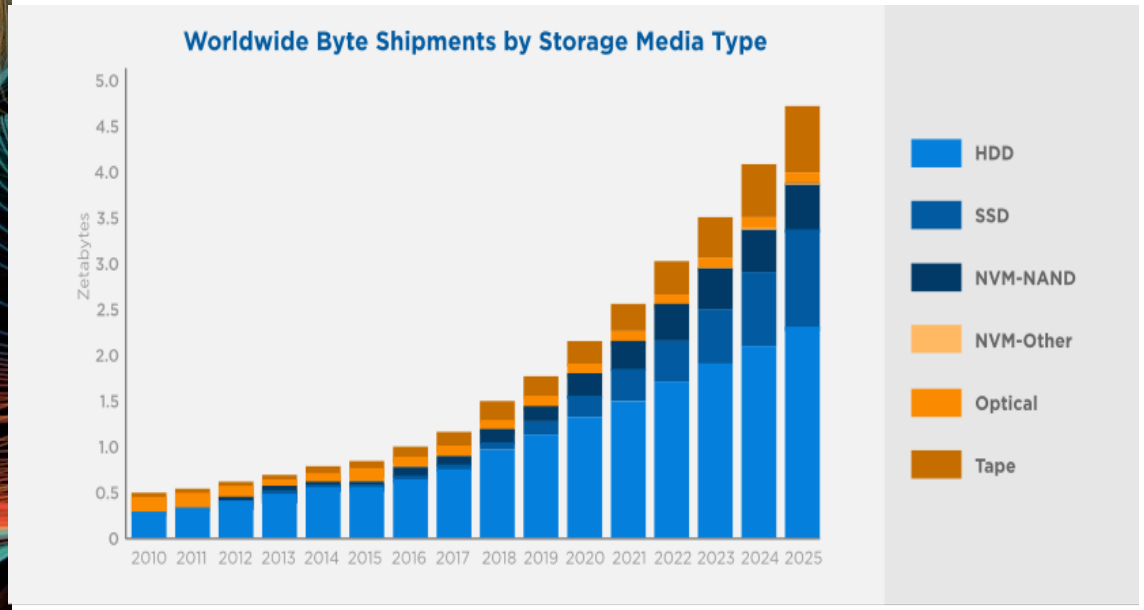


- CQ2 '17 HDD Exabytes Rise to 158.50
- 2CQ17 Total SSD Market: 15.156EB

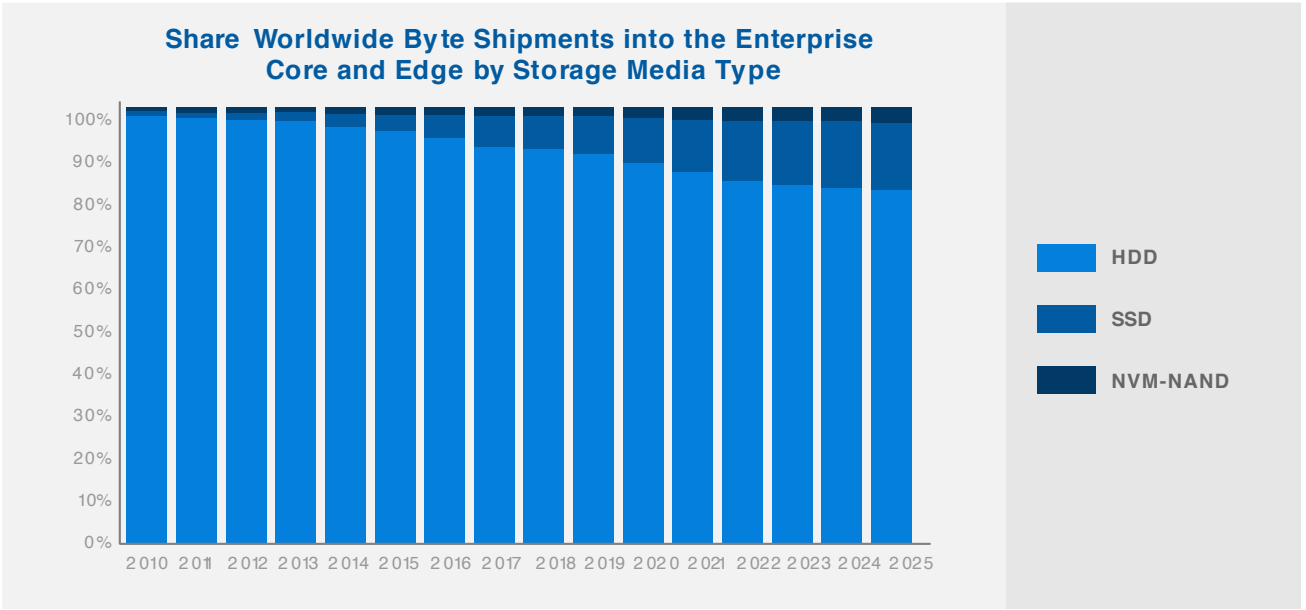
https://www.storagenewsletter.com/2017/08/16/2q17-hdd-ebabytes-rise-to-159-despite-lower-units-shipments-of-96-million-trendfocus/

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Судьба жесткого диска



Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018



Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018

К концу 2025 года 80% данных в ЦОД по-прежнему будут на HDD

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

The Largest Capacity HDD in the Market

Ultrastar DC HC550

Key Concepts

- World's first HDDs to use TSA (Triple Stage Actuator) for improved performance
- World's first HDDs to use EAMR (Energy-Assisted Magnetic Recording) for the most areal density
  - ePMR Energy Assist Recording
- 9 disk mechanical design increases capacity
- Common sealed technology & code base
- TDMR reader technology



Target Markets

Hyperscalers

Cloud

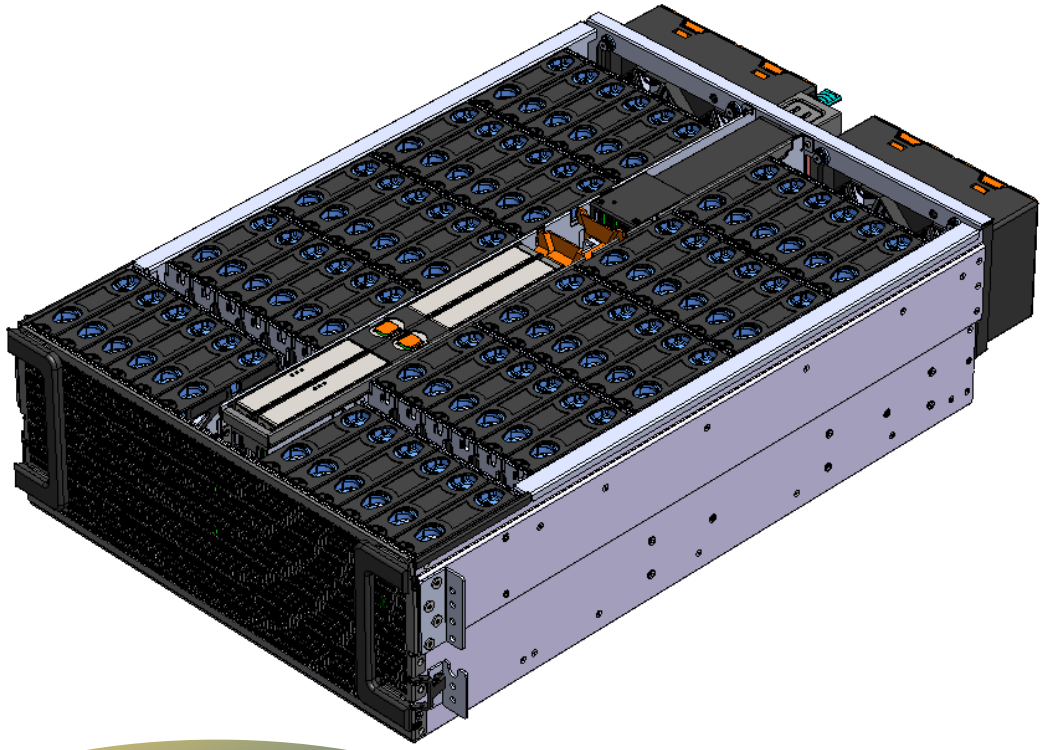
Key Features

- 18TB, 9-disk (2 TB/p)
- 16TB, 9-disk (1.78 TB/p)
- 6Gb/s SATA, 12Gb/s SAS
- 7200 RPM, 512MB Cache
- Security Models – Standard (SE), SED: TCG, TCG-FIPS (SAS).
- Ultrastar Enhanced Data Security
- Ultrastar reliability, warranty and workload
  - 2.5M hours MTBF,
  - 5-yr limited warranty
  - Up to 550TB/yr workload

Ultrastar® Data60 и Data102

Гибридные полки высокой доступности

- До 102 двухпортовых HDD и SSD (макс. 24) с горячей заменой
- 6# 4-полосных mini-SAS HD портов на один IOM
- Поддержка дисков 12Gb/s SAS-3 или 6Gb/s SATA-3
- До 12W на диск в полной набивке
- Поддержка отключения питания T10 Pin3
- Горячая замена всех FRU
- In-band и Out Of Band управление полкой
  - Out Of Band через IPMI / Redfish
  - In-band через SES-3
- Два блока питания 80+ Platinum 1600W

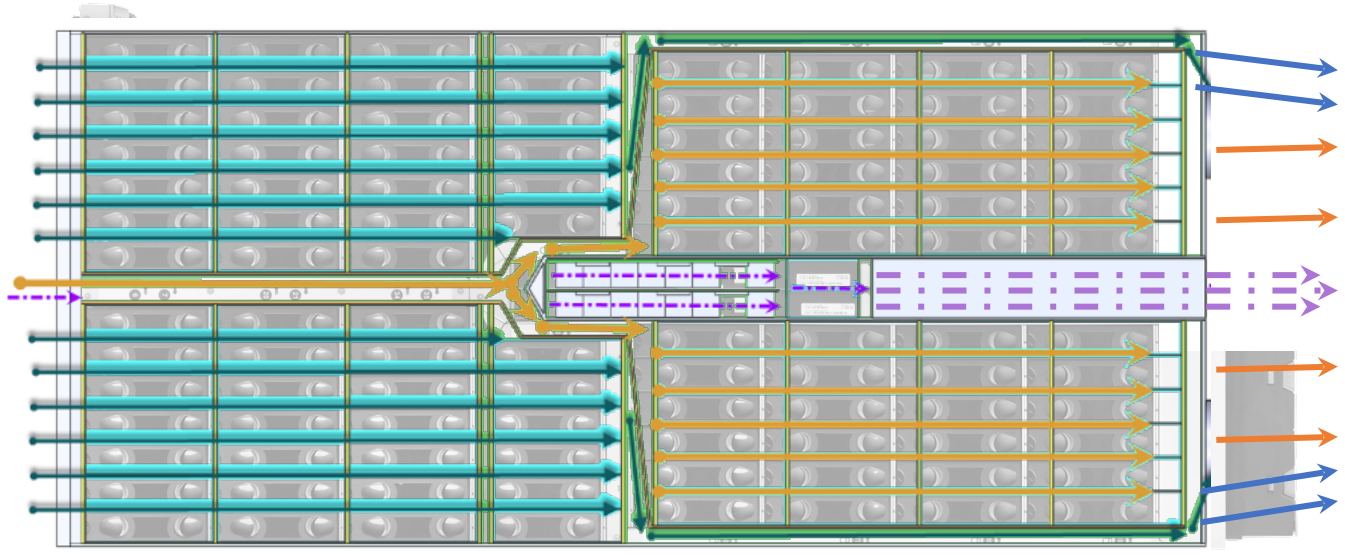


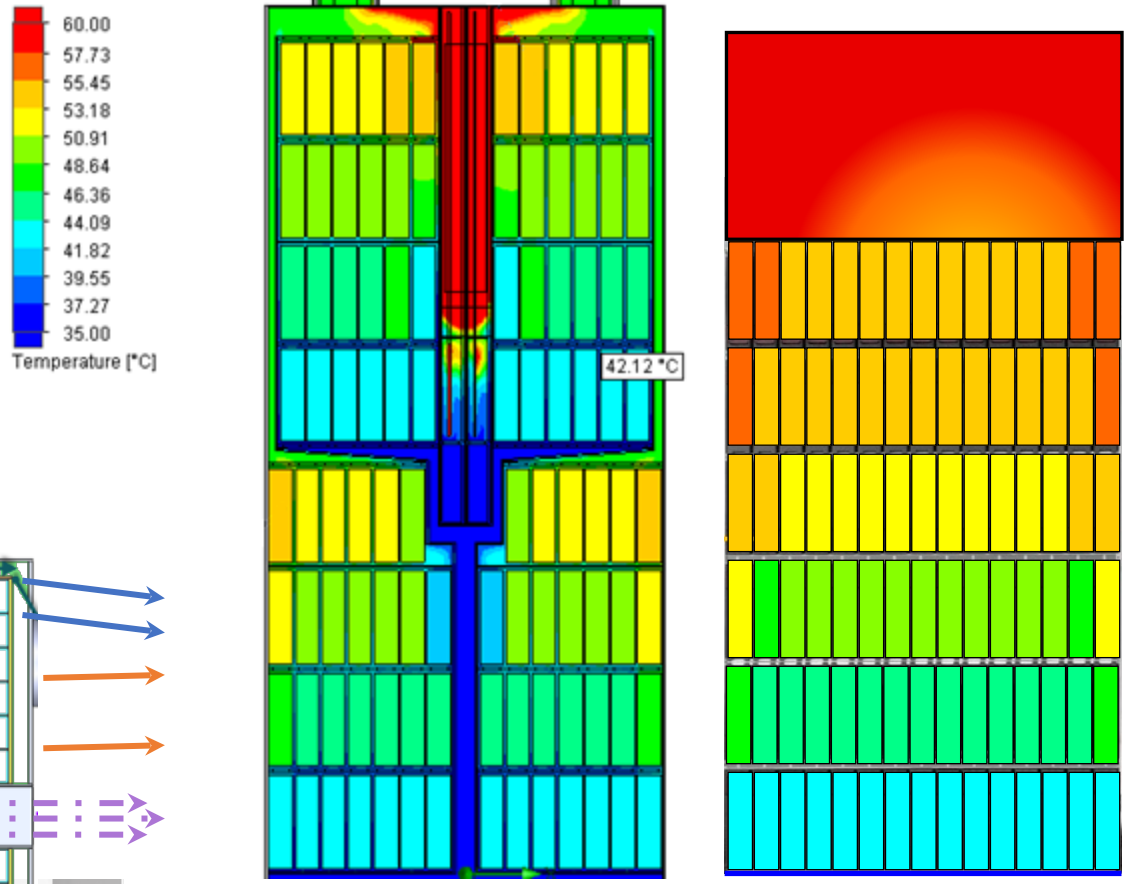
До 1,4 ПБ
в 4U x 1200mm

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Система охлаждения ArcticFlow™

- Параметры моделирования
  - @ 12W на каждый диск
  - 35°C окружающая температура
    - Разброс < 10°
    - Макс. Температура 54.11°C
    - He12 (8D HDD) работает на 9.8W
    - He10 (7D HDD) работает на 9.5W





HGST 4U102

Альтернативная 4U90

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

IsoVibe™

- Микрокод привода HDD и акселерометры компенсируют вибрацию и резонанс (спец. микрокод)
- Диски крепятся к шасси мини-салазками
- Салазки и винты не нужны
- Все диски механически изолированы эластичными посадочными местами в бэкплейне

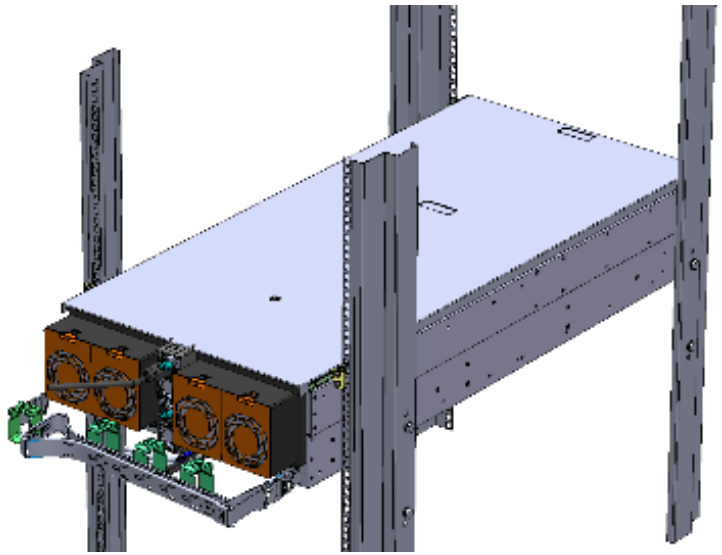
- Вибрация на 60% ниже по сравнению с конкурентами
- Максимальная производительность для дисков с высоким TPI
- Продлевает срок службы дисков
- Минимизирует количество ошибок

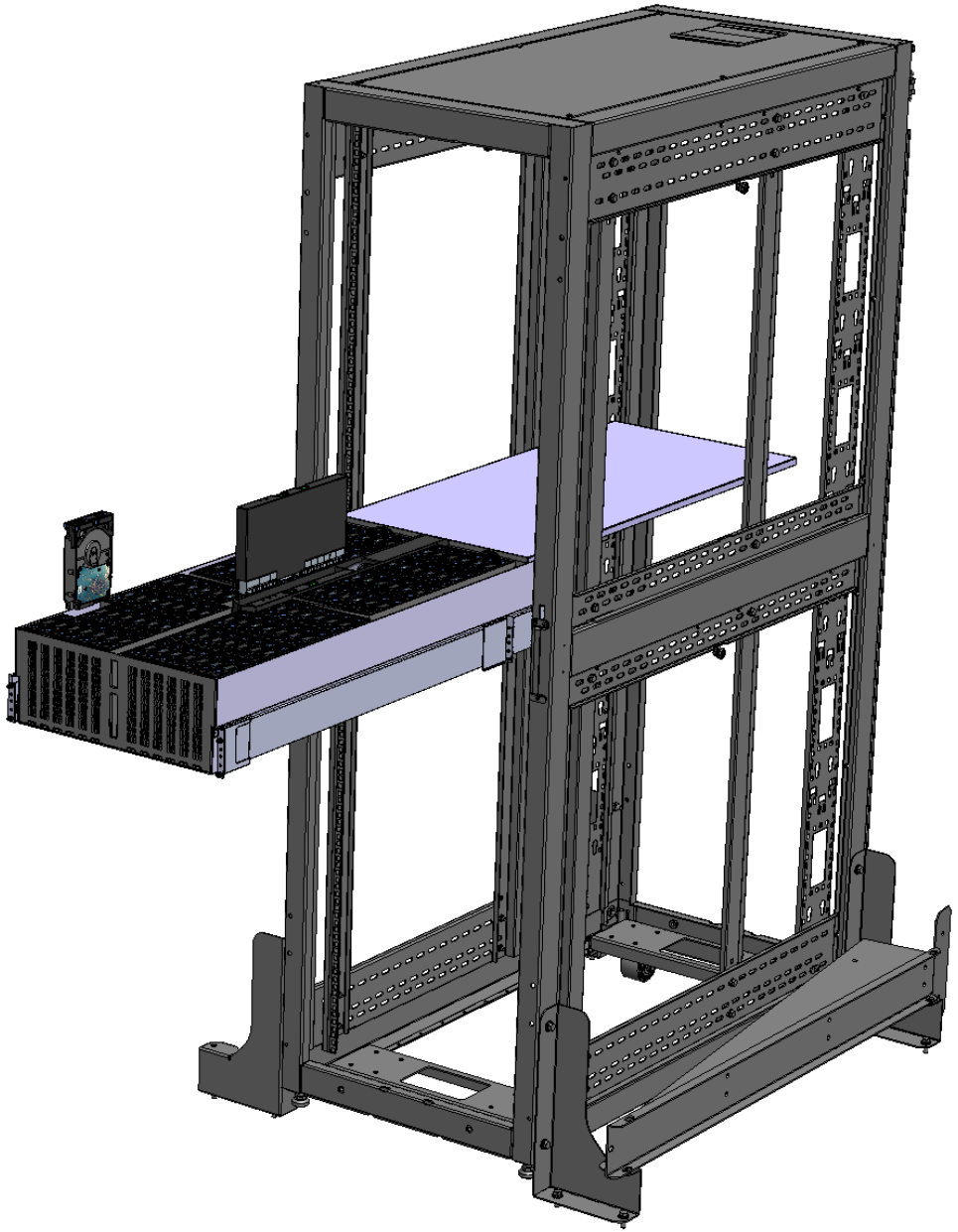


©2018 Western Digital Corporation or Its affiliates. All rights reserved.

Эксплуатация

- Верхняя крышка остается в стойке
- Кабели закреплены в стойке, и их трогать не надо

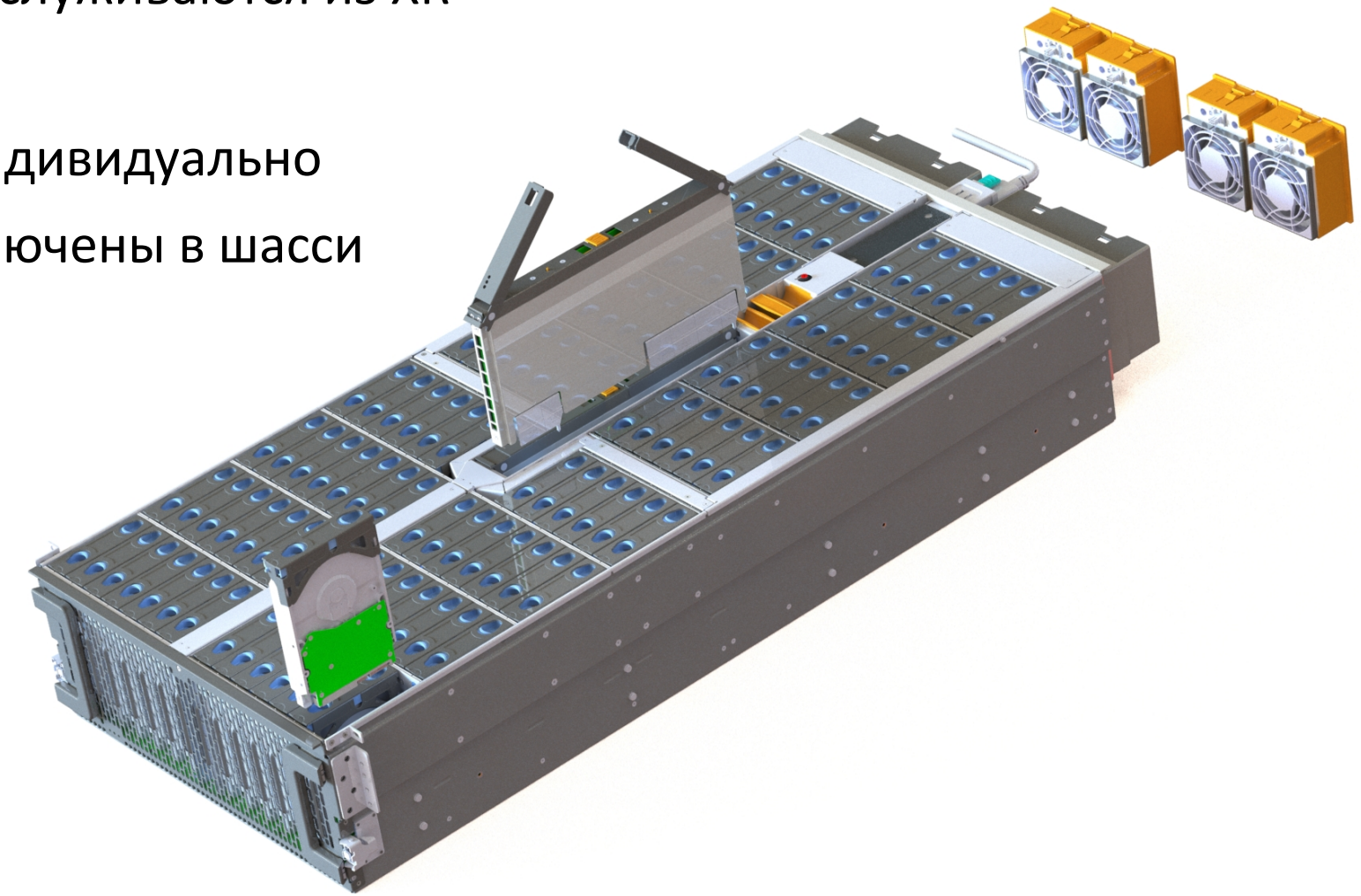




Western Digital.
© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Эксплуатация

- Основные компоненты обслуживаются из ХК
- Диски меняются на ходу
- Вентиляторы меняются индивидуально
- Интерфейсные кабели включены в шасси
  - IOM можно менять на ходу
- Инструменты не нужны



© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Производительность

Summary for 12TB SAS HDD Performance

Max Performance for 102 x HUH721212AL4204 12TB 7200 RPM SAS 12Gb/s HDD, 12 Hosts, Single Mount Madonna enclosure				
Profile	IOps		MBps	
SR	4K SR QD 8	3.27 M	> 128K Block size	24.3 GBps
SW	4K SW QD32	2.45 M	1MB	23.8 GBps
RR	4K RR QD 128	26 K	1MB RR QD 64	10.2 GBps
RW	4K RW all QD	45 K	1MB RW all QD	9.9 GBps

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Снижение возврата дисков на 62%

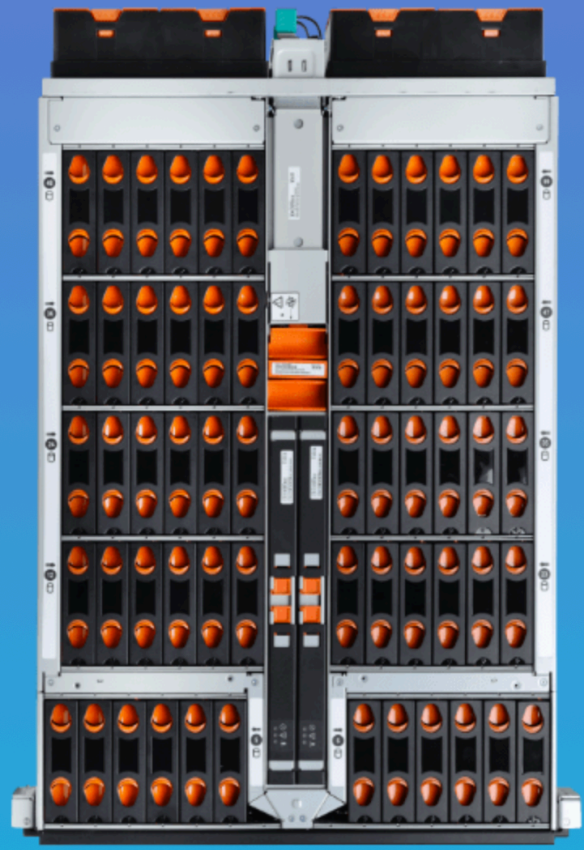
https://www.westerndigital.com/campaign/platform-innovations

Western Digital.

PRODUCTS SOLUTIONS INNOVATIONS CONTACT

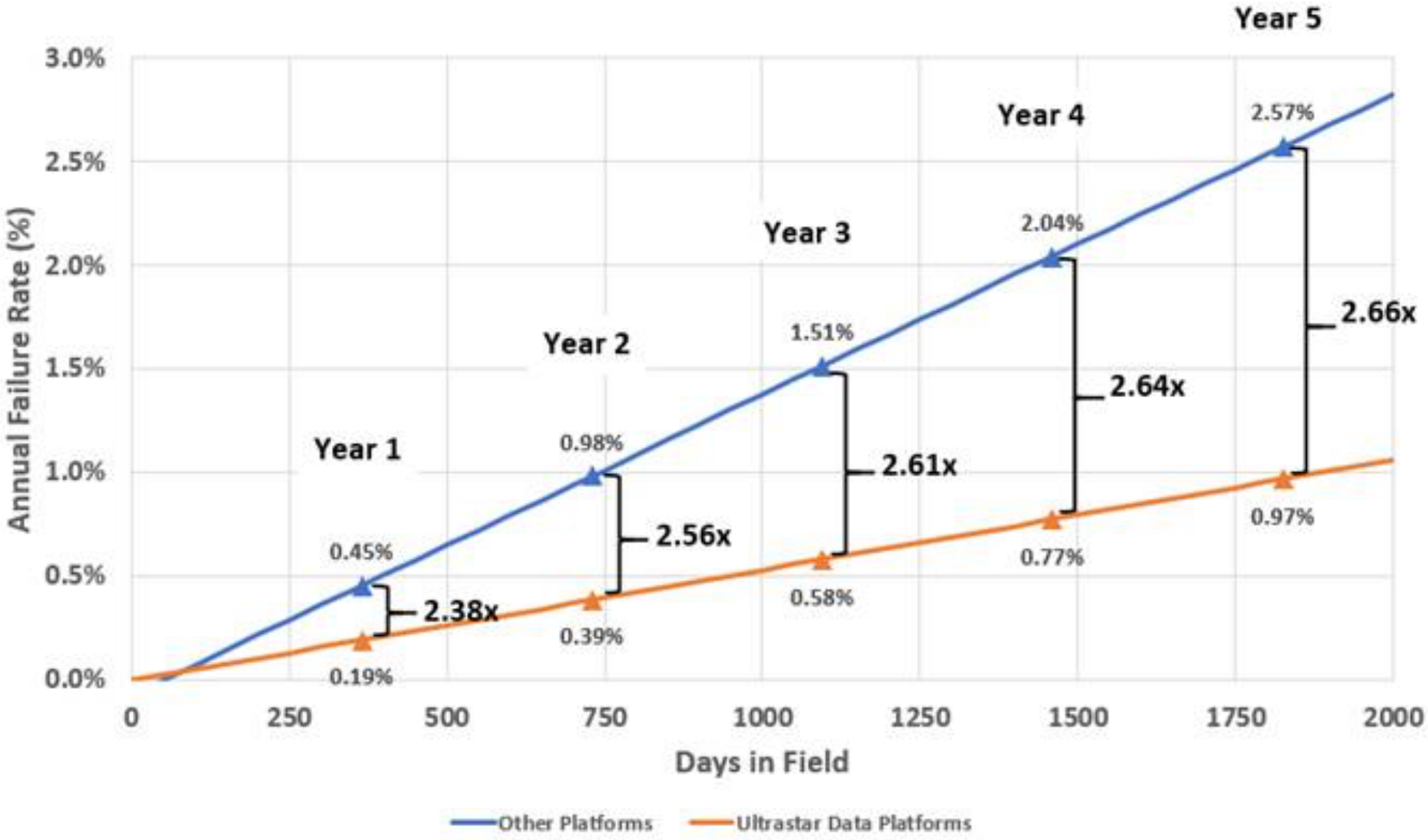
Ultrastar Platforms

Innovations Reduce Drive Field returns by 62%*



© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Надежность дисков в полках WDC



© 2020 Western Digital Corporation or its affiliates. All rights reserved.

QSAN

https://qsan.su/goods/sistemyi-xraneniya-dannyix/

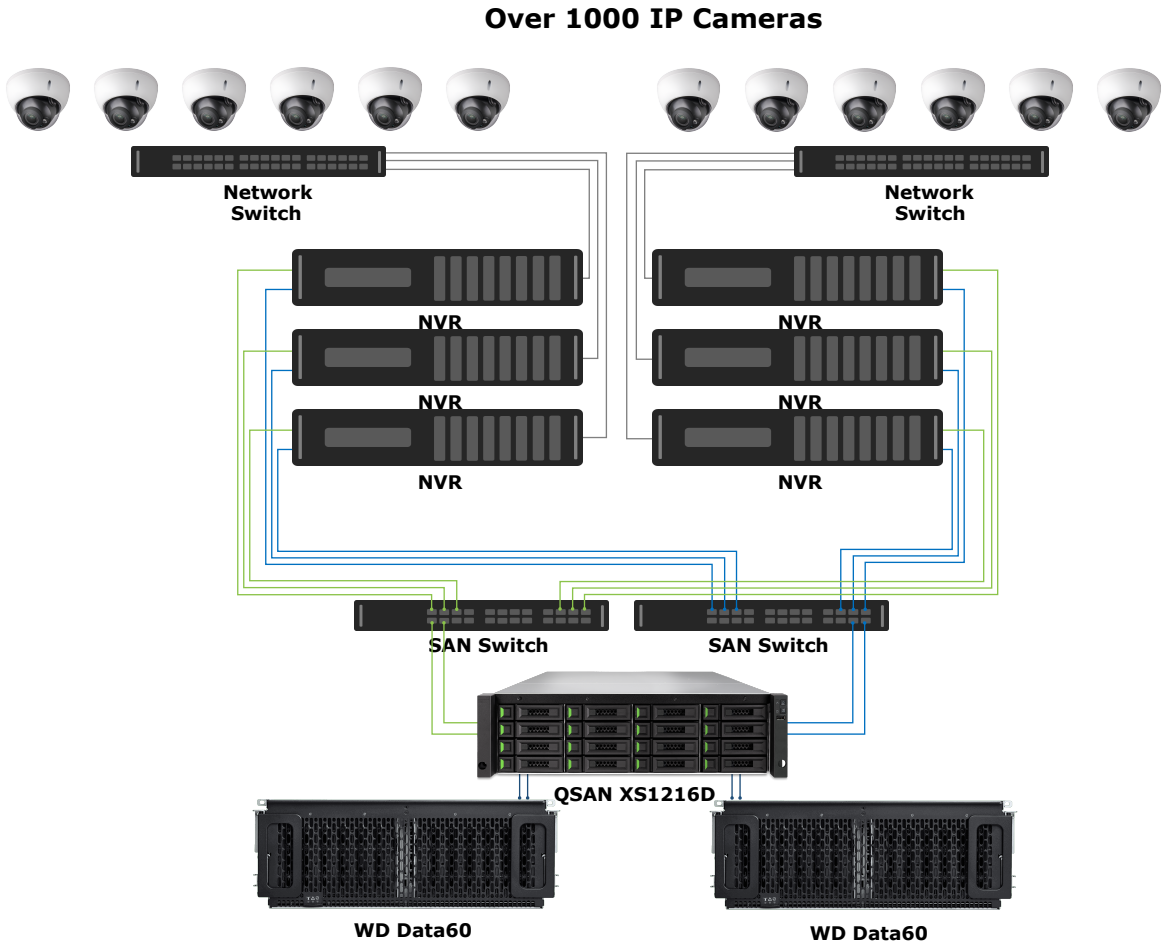


https://qsan.su/novosti/qsan-sert-western-digital-ultrastar-data60-for-xcubesan.html

https://qsan.com/en/newspage/218

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

SAN Solution for Surveillance – Dual Controller



- Ultrastar Data 60,102 has been certified with many to act as a dual controller architecture.
- All the camera feed data will be directly pushed from dual Controller architecture and distributed to Ultrastar Data 60.
- QSAN controllers provide all SAN & NAS features for multiple Surveillance needs.
- WDC Ultrastar Data 60 uses hybrid storage of Flash & HDD for performance rebalancing.
- Ultrastar Data 60 has been designed for durability .

© 2020 Western Digital Corporation or its affiliates. All rights reserved.

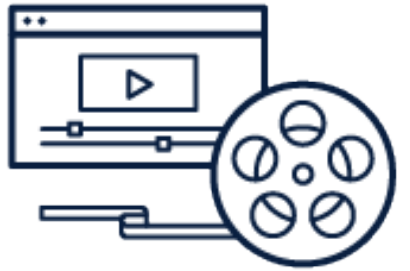
Raidix

https://www.raidix.ru/solutions/western-digital/

- Файловый (NFS, SMB, ATP, FTP) и блочный (FC, IB, iSCSI, SAS) доступ
- Минимальное влияние отказов накопителей и оборудования
- Высокая пропускная способность для интенсивных нагрузок
- Дополнительная защита данных за счет удаленной репликации
- Легкое масштабирование и гибкие конфигурации



Для видеонаблюдения



Для видеоконтента



Для корпоративных инфраструктур



Для HPC-инфраструктур

Референсные архитектуры:

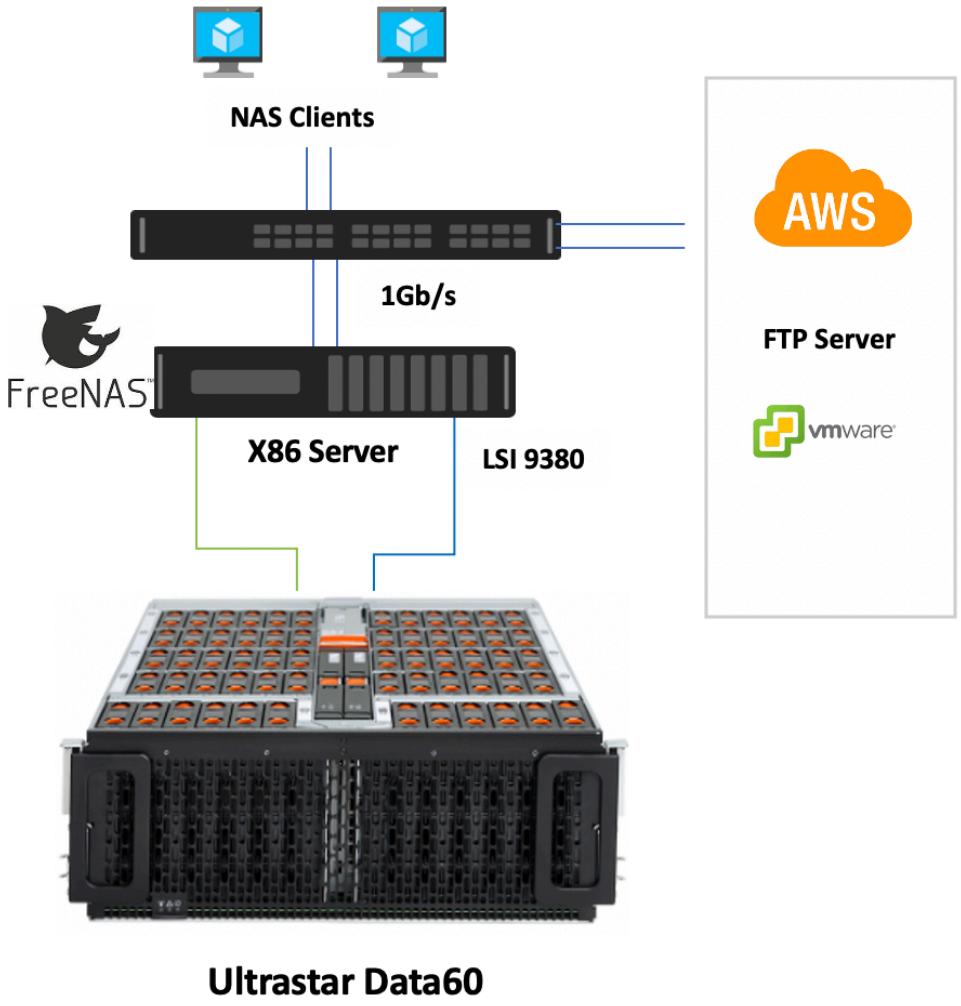
https://www.raidix.com/uploads/2018/10/reference-high-performance-fault-tolerant-data-storage-system.pdf

https://www.raidix.com/uploads/2018/10/reference-architecture-scale-out-data-storage-system.pdf

https://habr.com/ru/company/raidix/blog/354340/

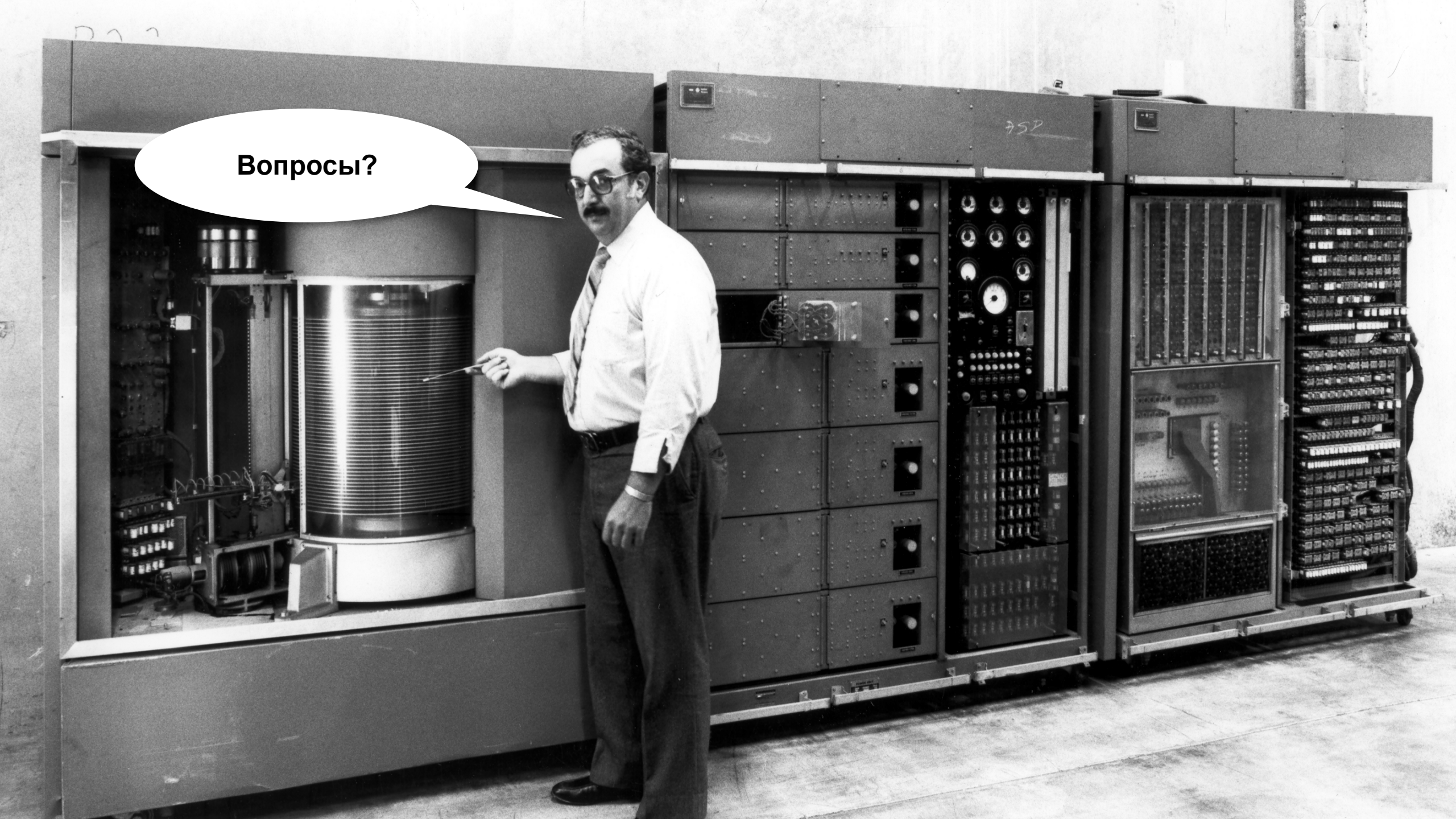
© 2020 Western Digital Corporation or its affiliates. All rights reserved.

Open Source NAS - FreeNAS



- Ultrastar UD 60,102 has been Qualified for FreeNAS.
- FreeNAS is opensource can able to provide all the high-level Enterprise class NAS features.
- Solution can use for any NAS requirement for Surveillance or File servers
- FreeNAS is based on ZFS, this will be robust solution with less failures

© 2020 Western Digital Corporation or its affiliates. All rights reserved.


Вопросы?