



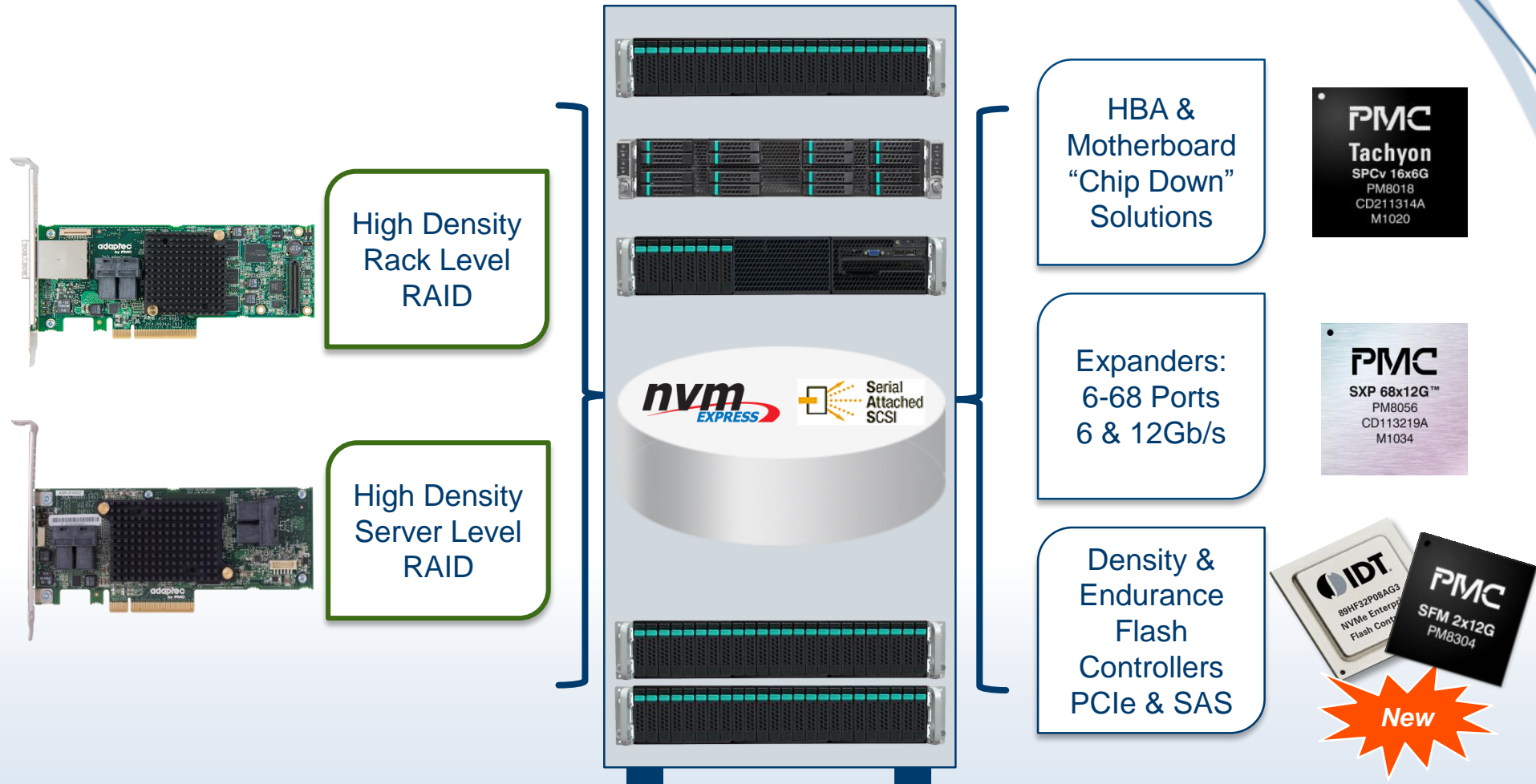
12G SAS RAID Controller

**Neue Adaptergeneration mit maximaler
Dichte, Flexibilität und Performance**

Paul Gagnon

Field Applications Engineer

PMC's Comprehensive Product Portfolio



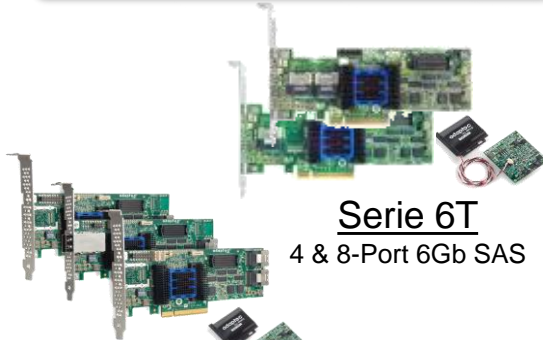
Überblick der Adaptec Storage Solutions Portfolio

6Gb/s - PCIe Gen2

6Gb/s - PCIe Gen3

12Gb/s - PCIe Gen3

RAID



Serie 6T
4 & 8-Port 6Gb SAS

Serie 6
4, 8, 4/4-Port 6Gb SAS
maxCache SSD Caching

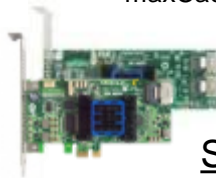


Serie 7
8, 16, 24, 16/8, 8/16-Port 6Gb SAS
maxCache SSD Caching



Serie 8
8, 16, 8/8-Port 12Gb SAS
maxCache Plus Caching & Tiering,
Embedded Supercap

Smart HBA



Serie 6E
4 & 8-Port SAS



Serie 7E
16-Port Int. 6Gb SAS

HBA



Serie 6H
4, 8-Port 6Gb SAS



Serie 7H
8, 16-Port 6Gb SAS HBAs
Encryption

Die Serie 8 12 Gbps SAS RAID Controller



- **Dichte** 16-Port nativ 12Gb/s SAS Adapter mit integriertem Flash Backup im LP/MD2 Form Factor
- **Flexibilität** Tiering & Caching Software with maxCache Plus™, zahlreiche Konfigurationsmöglichkeiten, um Preis/Leistung zu optimieren
- **Performance** 700,000+ IOPS - Über 60% schneller als die Vorgängerserie mit weiteren programmierbaren Performance Parameter

Series 8 Produktfamilie



81605ZQ



8885Q

ASR-81605ZQ is the industry's first high port-count PCIe Gen3 solution with integrated green backup



8885



8805

ASR-8885 doubles the internal/external port count of the competition while maintaining the LP/MD2 form-factor



8405

Neu

Juni
2014



AFM-700

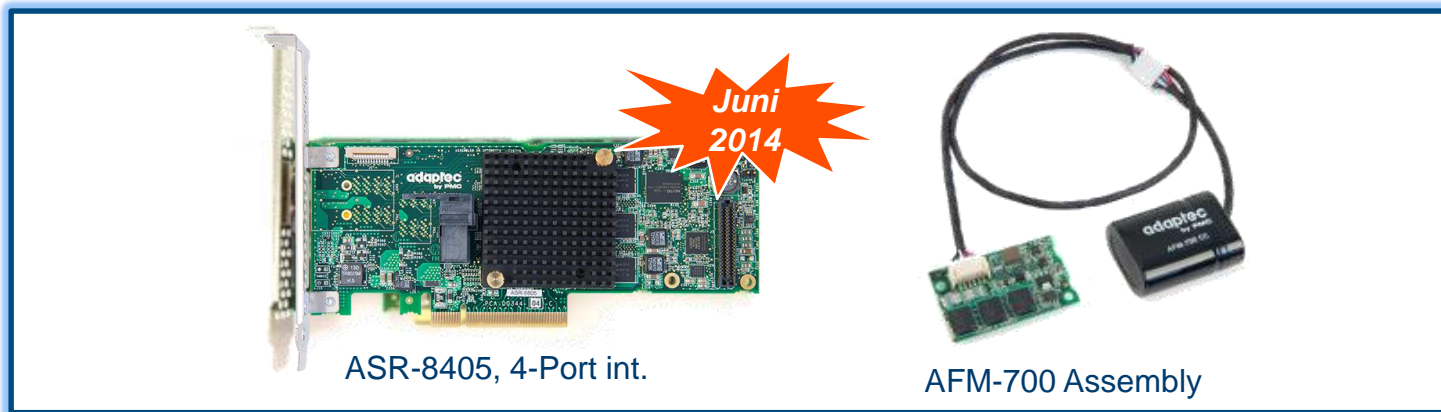
Adapter Family Highlights

- Unterstützt SAS 3.0, 12Gb/s
- x8 PCI-Express Gen3
- 1024MB DDR3-1600 DRAM
- HD miniSAS Konnektoren

AFM-700 "Adaptec Flash Modul"

- Im ASR-81605ZQ integriert
- Volle Überwachung vom Supercap & AFM Status

ASR-8405: Neuestes Mitglied der Serie 8



ASR-8405, 4-Port int.

AFM-700 Assembly

Adapter

- SAS 3.0, 12Gb/s & SATA 6 Gb/s
- PCIe Gen3 x8 mit 8 GB/s Bandbreite
- 1024MB DDR3-1600MHz DRAM
- HD miniSAS Konnektoren

AFM-700 "Adaptec Flash Modul"

- Im ASR-81605ZQ integriert
- Volle Überwachung vom Supercap & AFM Status

Series 8 Family	Connector Type	Form Factor
8405	1 x SFF-8643	LP / MD2
AFM-700	NA	Length: 43.4mm Width: 37.70mm Thickness: 18.8mm

Projected Performance Metrics – Streaming		
RAID Level	Reads (MB/sec)	Writes (MB/sec)
0	6600	6600
10	6600	3300
5/6	6600	3600

Serie 8 RAID Controller

Industry's first 12Gb/s Low Profile High-Port RAID Controller!



ASR-8805, 8-Port int.



ASR-8885 , 8885Q 8 int / 8 ext



ASR-8405, 4-Port int.

Neu

Q2'14

Adapter

- Support for SAS 3.0, 12Gb/s & SATA 6 Gb/s
- PCIe Gen3 x8
- 1024MB DDR3-1600MHz DRAM
- HD mini SAS connectors

AFM-700

- Full monitoring of Supercap & AFM status
- Instant capacity measurement

Features


- Pass-through Device, Simple Volume, RAID 0,1, 10, 1E, RAID 5, 6, 50, 60, Hybrid RAID 1, 10
- SSD Read & Write Caching (8885Q)
- Up to 700K IOPS performance with SSDs
- Supports full ARC feature set

Series 8 Family	Connector Type	Form Factor
8885 / 8885Q	2 x SFF-8644 2 x SFF-8643	LP / MD2
8805	2 x SFF-8643	LP / MD2
Neu 8405	1 x SFF-8643	Juni 2014
AFM-700	NA	Length: 43.4mm Width: 37.70mm Thickness: 18.8mm

Projected Performance Metrics – Streaming		
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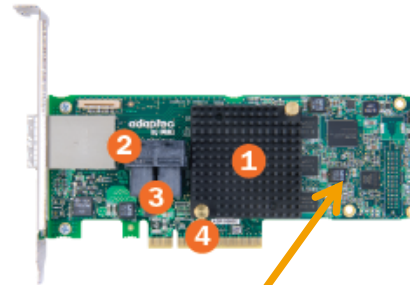
Serie 8 - RAID Produkte & Awards

The Series 8 family features:

- 1 PMC's PM8063 RAID-on-Chip (ROC), x8 PCIe Gen3 interface with 12Gb/s SAS ports to enable a new generation of performance
- 2 16 native SAS/SATA ports in a LP/MD2 design
- 3 12Gb/s throughput with mini SAS HD connectors 
- 4 > 700K IOPS; 6.6GB/s sequential reads, 5.2GB/s sequential writes



ASR-81605ZQ



AFM-700



What The Industry Says

"Their ASR-8885 is a great RAID adapter. It offers 16 ports of 12Gbps SAS with amazing throughput. We had no issues hitting 700K IOPS and 6GB/s.

Those are amazing maximums, but we were more impressed with the incredible consistency that we observed. With sub-microsecond variance, the Series 8 destroyed our latency tests."

Ben Chase
The SSD Review



Serie 8: Über Jahre fortschreitende Integration des batteriefreien Write Cache Schutzes



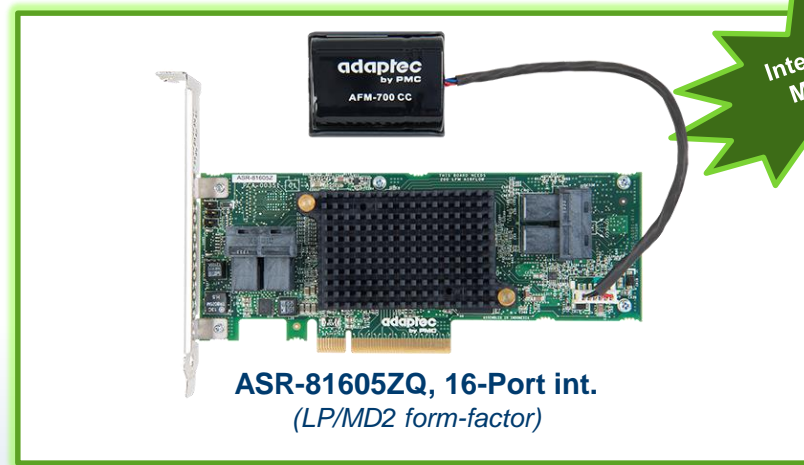
2nd Generation



3rd Generation



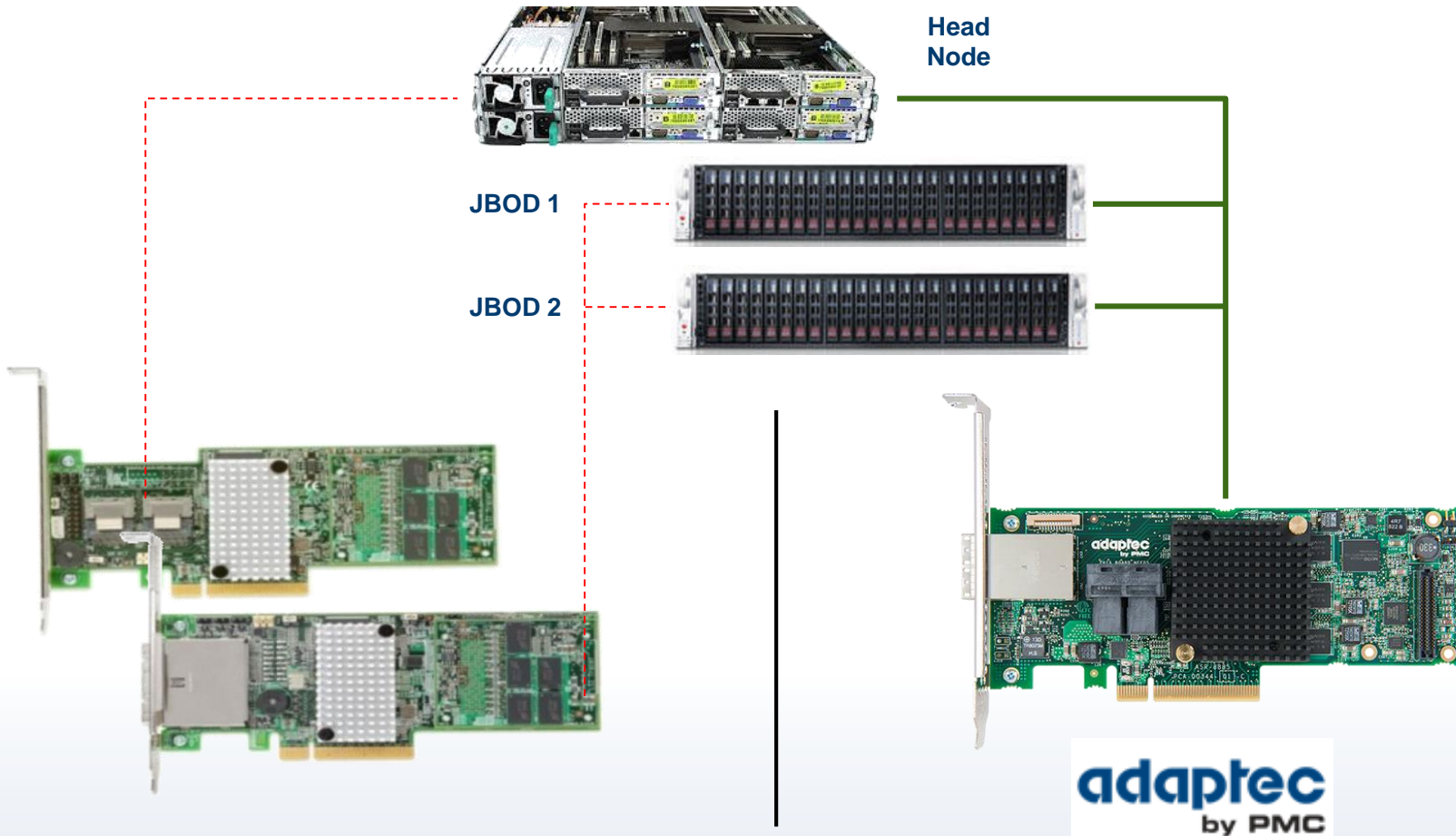
4th Generation



- ✓ Higher attach rate of green back-up for RAID and non-RAID configurations
- ✓ Optimizes airflow/cooling and eliminates daughter card, increasing MTBF
- ✓ Simplifies SKU/inventory management

Series 8 – Komplettlösungen vereinfachen

Eliminate complexity and reduce Total Cost of Ownership



Requires 2 cards to achieve configuration & leverage PCIe Gen3 8 lane bandwidth for JBOD connectivity, adding cost, power consumption & decreasing MTBF

One card supports internal & external connectivity and leverages PCIe Gen3 bandwidth for JBOD connectivity

Serie 8 – Typische High Port Count Konfigurationen

Capacity and Performance

ASR-81605ZQ



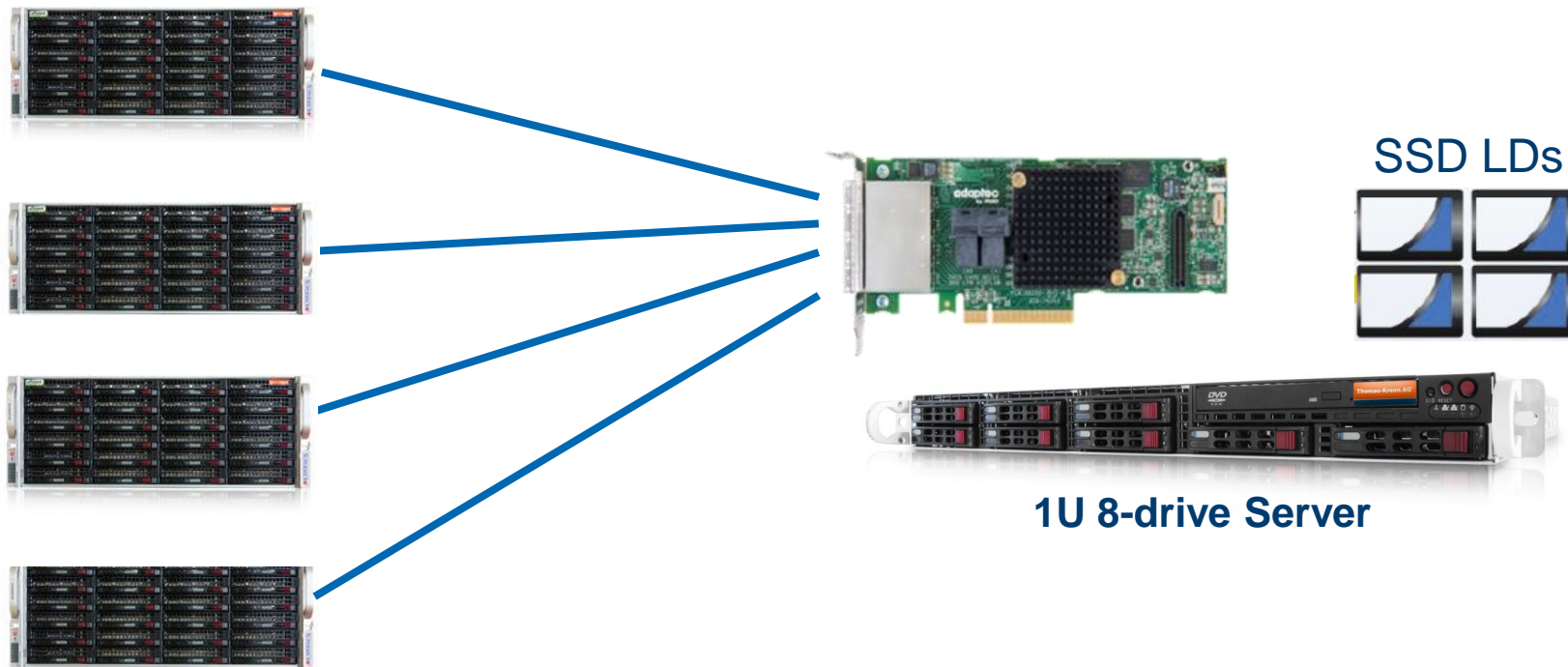
ASR-72405



- **Problem:** Expander Backplanes ermöglichen Skalierbarkeit aber beeinträchtigen zwangsläufig die Performance durch zusätzliche Latenzzeiten and können Kompatibilitätsprobleme hervorrufen
- **Lösung:** Serie 7 oder 8 (72405 / 81605ZQ) mit 16 bzw. 24 direct attached Drives

Serie 8: Zahlreiche Konfigurationsmöglichkeiten

High Density Rack Storage



24 Drive JBODs

Series 8:

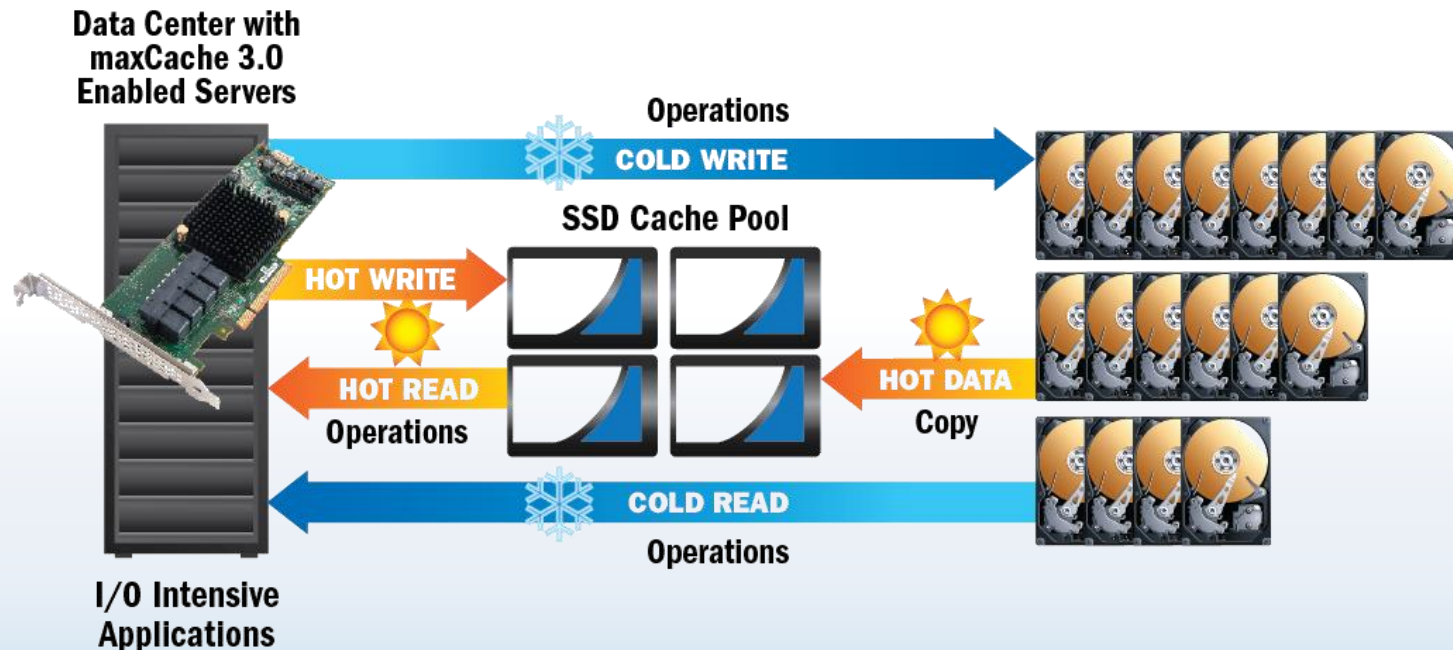
- **Problem:** 1 HE Server können nur eine begrenzte Anzahl von Laufwerken beherbergen
- **Solution:** Serie 7 (78165) or Serie 8 (8885Q), Low Profile MD2 RAID Controller
 - Verbindung zu 8 internen SSDs/HDDs als logische Laufwerke für performance-kritische Daten
 - Connectivity nach Außen fast unbegrenzt



maxCache and maxCache Plus

maxCache 3.0 SSD Caching

- “Hot Data” wird in SSD Read und Write Cache optimal verwaltet
 - Algorithm improvements mean read-intensive applications can get up to 13x increase in IOPs and 13x reduction in latency
 - Writes go to SSD cache pool, leveraging the performance benefits of SSDs over HDDs



Die maxCache Plus Strategie

maxCache 3.0 SSD Caching beschleunigt Anwendungen aber ...

- Unterstützt nur SATA/SAS Geräte, die an “**adaptec by PMC**” RAID Controllern angeschlossen sind
- Logische Laufwerke haben die Größe von den vorhandenen HDD Arrays

maxCache Plus – weitere Optimierung der Server Storage

- Kann alle Storage Geräte im System beanspruchen
- Tiering Konzept mit Virtual Volumes aus langsameren und schnelleren Arrays



Die maxCache Plus Strategie

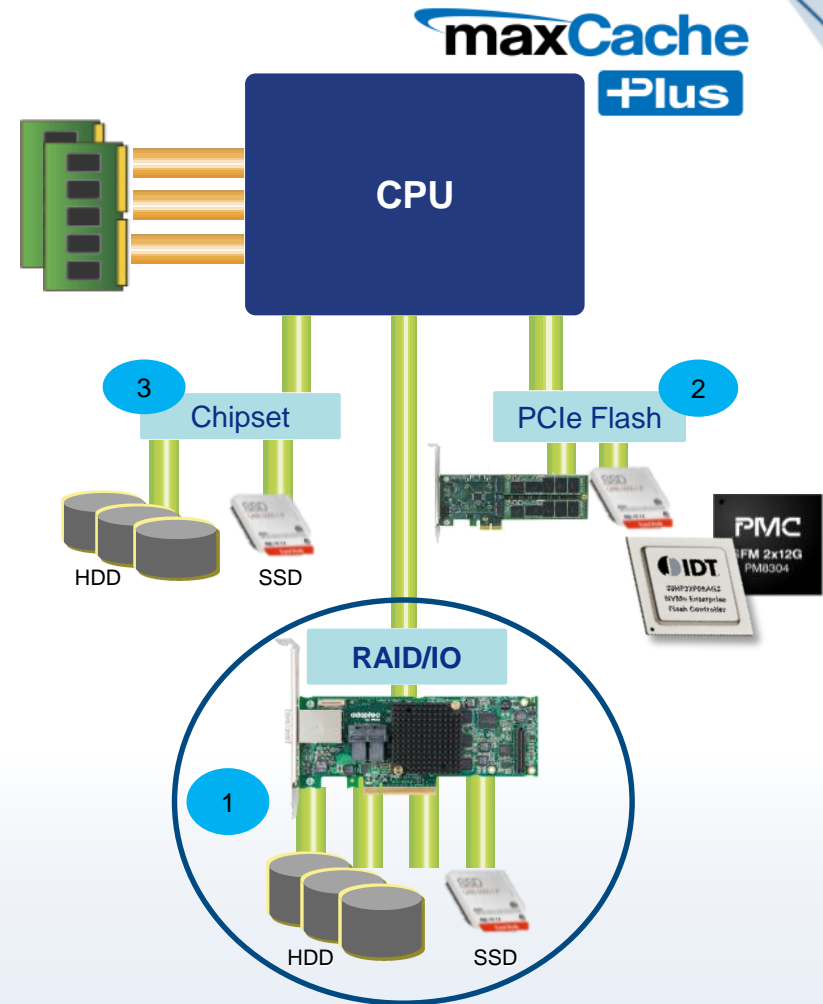
- **SSDs kosten in etwa 5 bis 7 Mal mehr als HDDs pro GByte**
- **SSDs können circa 500 Mal mehr IOPs als HDDs**
- **SSDs sind in etwa 3 Mal so schnell wie HDDs mit großen sequentiellen Übertragungen**



Flexibilität durch Software

Optimizing the Structure of Server Storage

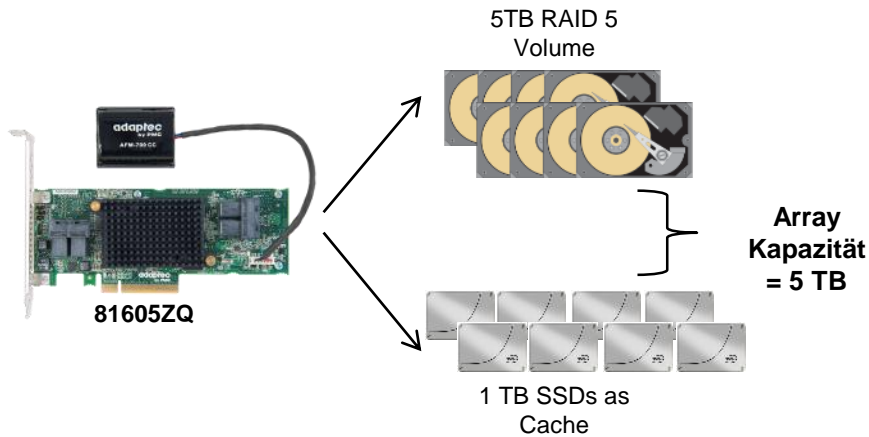
- Adaptec's maxCache Plus combines tiering technology and caching software to ensure that IT managers optimize their storage investment
- Provides flexibility to configure all storage devices in a server environment:
 1. RAID & I/O HBAs
 2. PCIe Flash Devices
 3. Motherboard Chipset Devices
- Manages storage structure through a Volume Manager and a Policy Engine
 - Volume Manager - manages the I/O to/from the tiered volume and routes the I/O to right tier group
 - Policy Engine - is the intelligence of the solution and determines where to place the managed data
- The maxCache Plus solution is included with the Series 8Q family as a complete package



The most value & performance for your storage assets

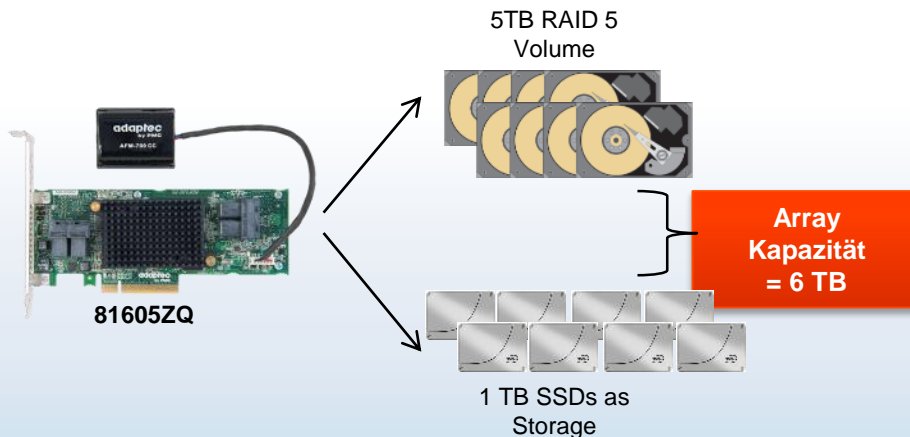
maxCache Plus

Basic SSD Caching vs. Tiering



SSD Caching

- Arraygröße = Kapazität des HDD Volumes
- SSDs beschleunigen Performance
- SSD Arrays dienen als Read/Write Cache für HDD Volumes
- SSD Cache RAID-0, 1, 1E, 10, 5
- SSD Caching Arrays bis 2TB

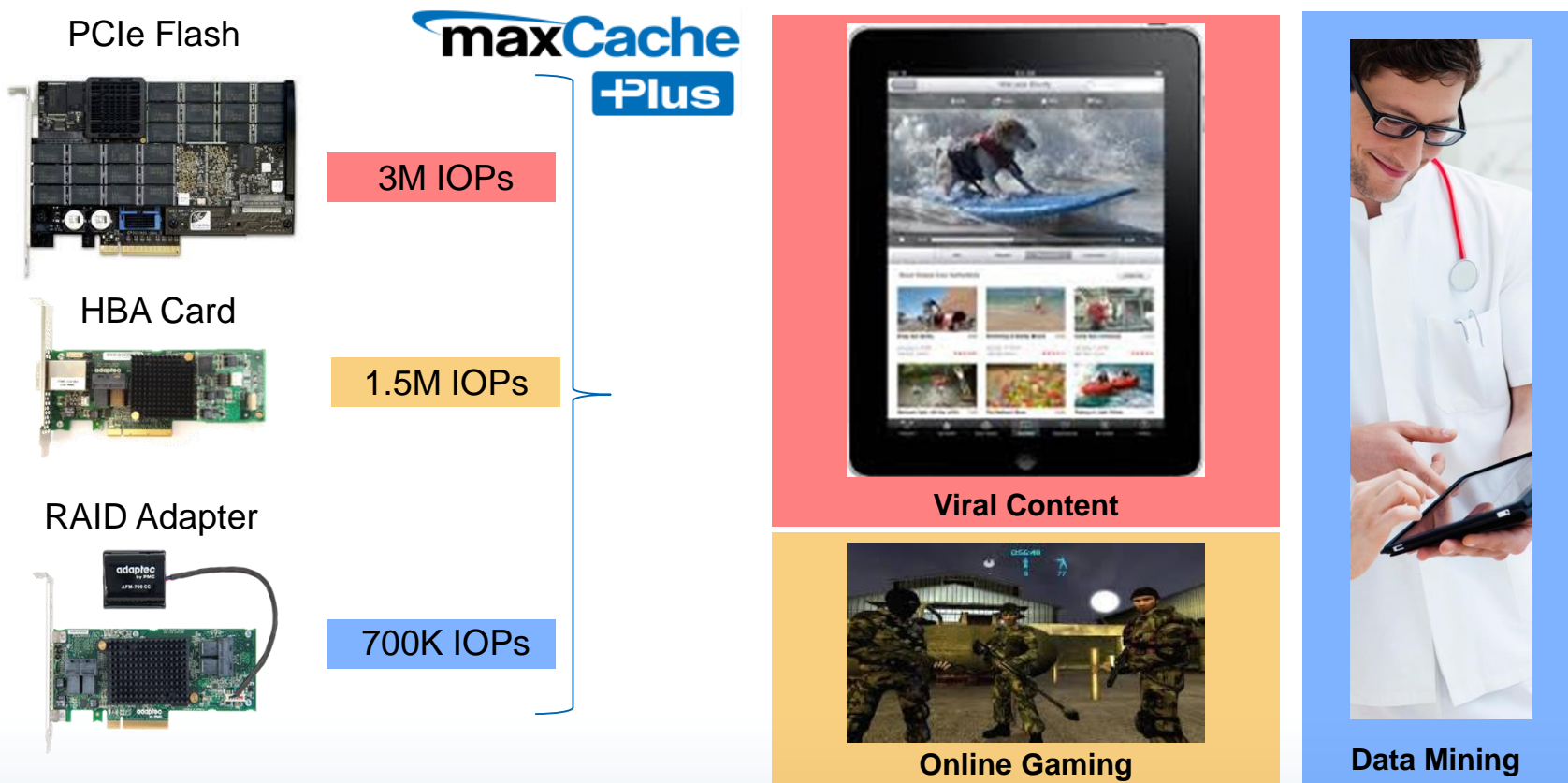


maxCache Plus Tiering

- Arraygröße = SSD & HDD Volume Kapazitäten zusammen
- Daten landet je nach "Temperatur" in die richtige Tieringstufe

Use Case: Tiering

Total Storage Structure Optimization



The new maxCache Plus with Series 8 provides the flexibility to configure all storage devices in a server environment, not just those connected to PMC RAID Adapter. All storage assets in a server can be leveraged according to their performance capabilities with the fastest media used for data acceleration, enabling the most cost-effective storage architecture.

maxCache Plus Tiering - maxView GUI

The screenshot displays the maxView Storage Manager interface in a Firefox browser window. The main content area shows the configuration for a maxCache Plus controller, divided into three sections: Controller info, Resources, and Key features.

Controller info

Type	Controller
Model	Adaptec ASR8885Q
Controller Number	1
Physical Slot	1
BIOS Version	7.4-0 (30860)
Firmware Version	7.4-0 (30860)
Driver Version	7.4-0 (30850)
Host Bus Type	PCIe
Host Bus Speed	8000 MHz
Host Bus Link Width	8 bits/links
Status	
Controller Status	Optimal
Controller Temperature	Normal (90C / 194F)
Settings	
Automatic Failover	Enabled
Consistency Check	Disabled
Copy-Back	Disabled
Task Priority	High
Performance Mode	Dynamic
NCQ	Enabled

Resources

Logical Devices	3
Spares	0
Ready Drives	12
Phys	
Phy 0	12.00 Gb/s
Phy 1	12.00 Gb/s
Phy 2	12.00 Gb/s
Phy 3	12.00 Gb/s
Phy 4	12.00 Gb/s
Phy 5	12.00 Gb/s
Phy 6	12.00 Gb/s
Phy 7	12.00 Gb/s
Phy 8	No device attached
Phy 9	No device attached
Phy 10	No device attached
Phy 11	No device attached
Phy 12	No device attached
Phy 13	No device attached
Phy 14	No device attached

Key features

Intelligent power management

Drive spinup limit	
Internal	0
External	0
Stay awake status	
Status	Disabled

Cache backup unit

Backup Unit Type	AFM-700/700LP
Overall Backup Unit Status	Ready
Temperature (Max Recorded)	36 C (40 C)
Charge Level	100 %
Estimated Life-time	5 Years, 0 Month

maxCache

maxCache Status	Supported, Not Present
Pool Size	Not applicable
Pool Type	Not applicable

The left sidebar shows a tree view of the storage hierarchy, including Enterprise View, WIN-G9PF0SPMBMD, maxCache Plus, Virtual Volumes, Virtual Pools, and Controller 1. The bottom taskbar shows the Windows operating system with various icons and a system tray displaying the time as 13:11 on 13.03.2014.

lometer

Topology

- All Managers
 - WIN-G9PFOSPME

Disk Targets | Network Targets | Access Specifications | Results Display | Test Setup

Results Since: Start of Test Last Update

Update Frequency (seconds): 1 2 3 4 5 10 15 30 45 60 ∞

Display

Metric	Value	Target
Total I/Os per Second	12059.81	60000
Total MBs per Second	47.11	100
Average I/O Response Time (ms)	15.9638	100
Maximum I/O Response Time (ms)	420.1680	1000
% CPU Utilization (total)	5.52 %	10 %
Total Error Count	0	10

Run 1 of 1



Topology

- [-] All Managers
- [+] WIN-G9PF0SPME

Disk Targets | Network Targets | Access Specifications | Results Display | Test Setup

Drag managers and workers from the Topology window to the progress bar of your choice.

Results Since

Start of Test

Last Update

Update Frequency (seconds)

1 2 3 4 5 10 15 30 45 60 oo

Display

Total I/Os per Second	All Managers	381441.12	60000	>
Total MBs per Second	All Managers	1490.00	10000	>
Average I/O Response Time (ms)	All Managers	0.5029	10	>
Maximum I/O Response Time (ms)	All Managers	2.1181	10	>
% CPU Utilization (total)	All Managers	52.35 %	100 %	>
Total Error Count	All Managers	0	10	>

lometer 2006.07.27



382271.79

All Managers - Total I/Os per Second

Settings

Total I/Os per Second

Range Show Trace

Test Controls

PMC_

2R2



Vielen Dank!

Haben Sie Fragen ?
