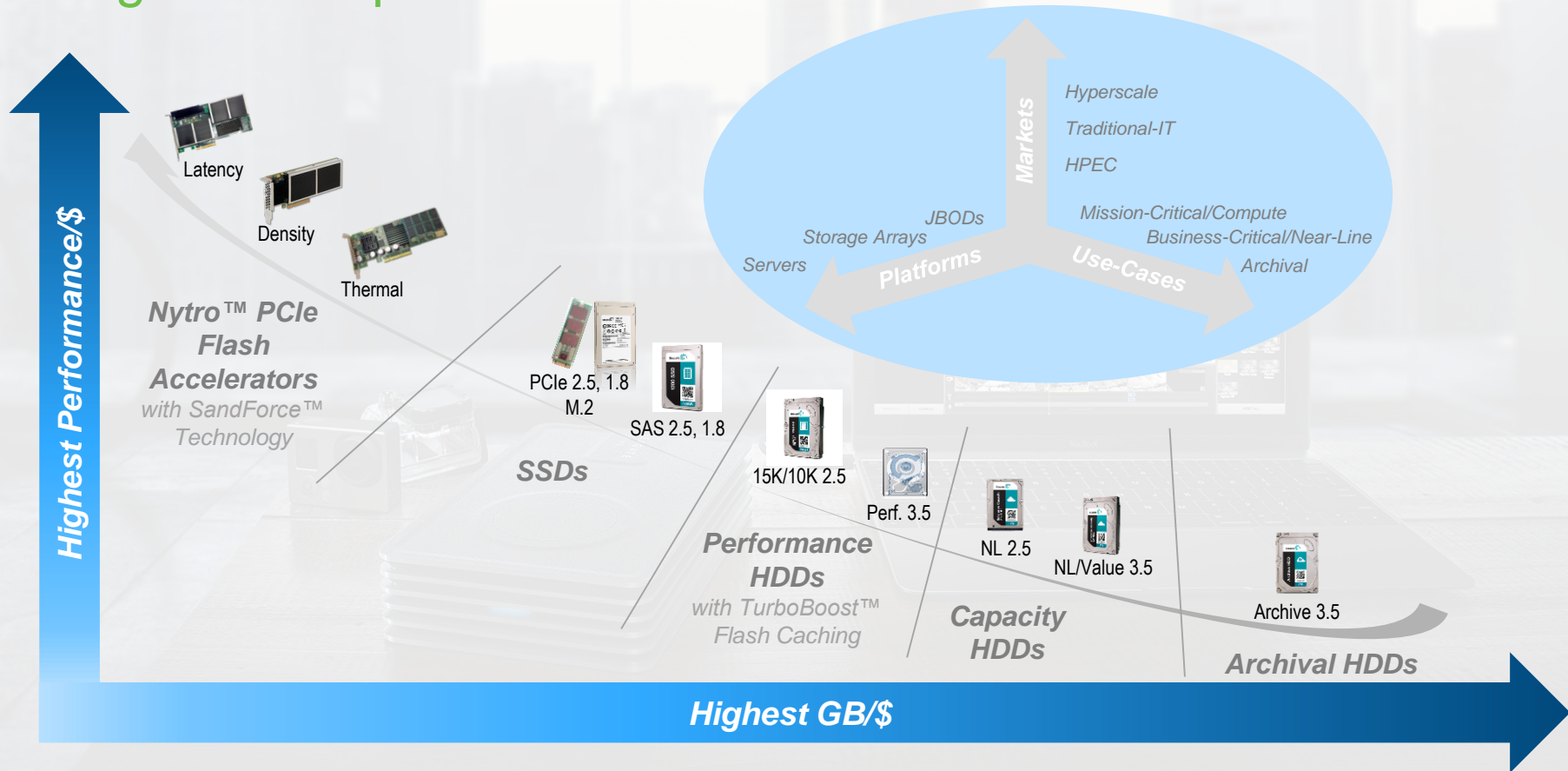




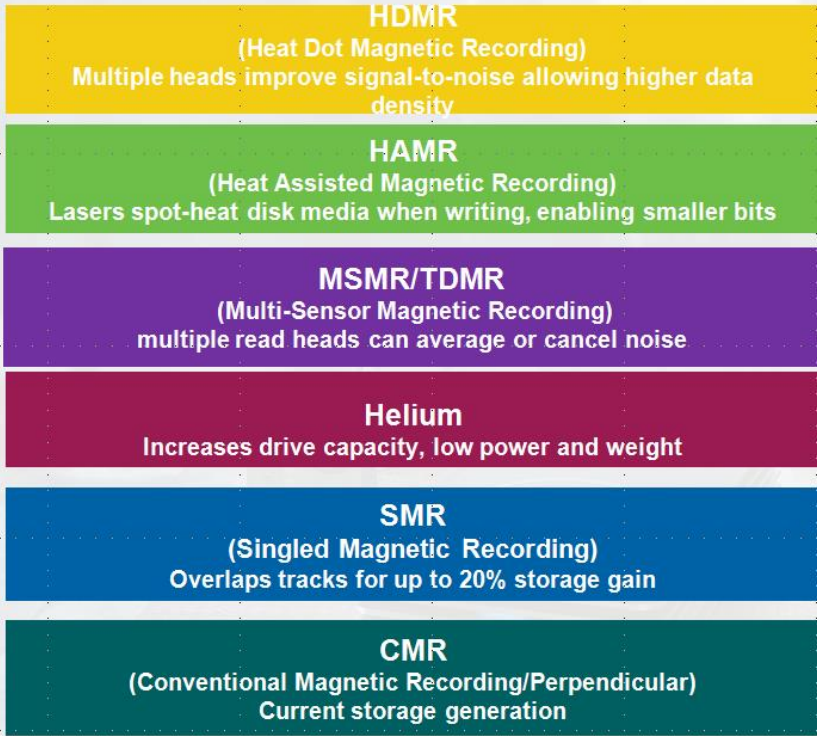
Nazmi Keskiner
Senior CTS Engineer DACH

Seagate Enterprise Devices Portfolio



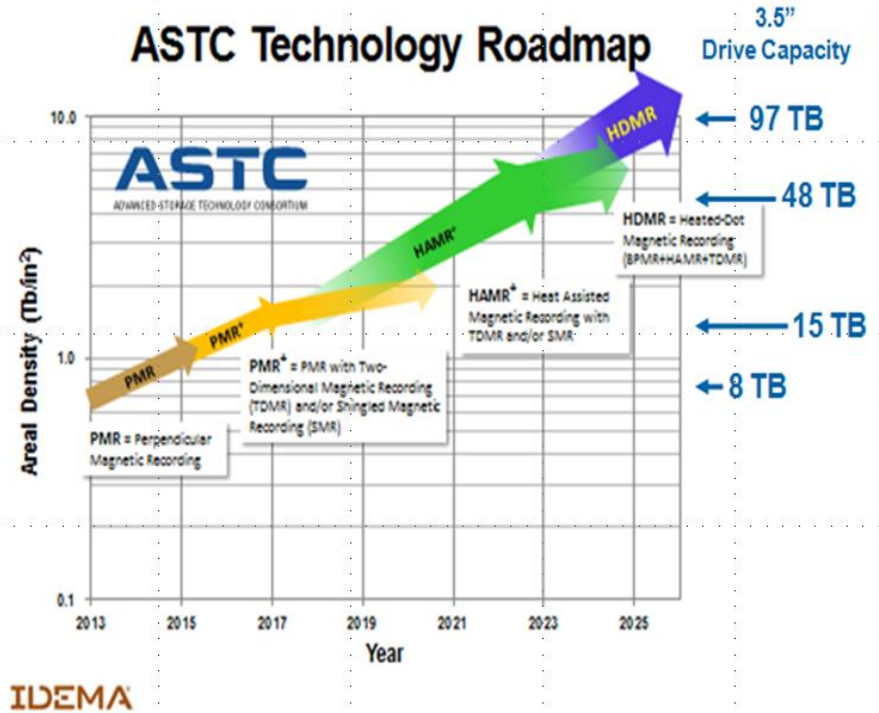
Sustained Investment to Areal Density Growth/Reliability

Technology Evolution



Seagate's technology investments

ASTC Technology Roadmap



Industry's projection of areal density growth



HARD DRIVES

For performance, mission-critical applications

Enterprise Performance 15K HDD

Up to 900GB

Industry's fastest 12Gb/s SAS hard drive for improving your server response times.

Enterprise Performance 10K HDD

Up to 2.4TB

Perfect drive that balances high capacity and high performance for demanding data center applications.

For storage-intensive applications

Enterprise Capacity 3.5 HDD (Helium)

Up to 12TB

High density storage for new Cloud data centers offering the lowest Total Cost of Ownership (TCO).

Enterprise Capacity 3.5 HDD

Up to 8TB

Helps both on-premise and off-premise data centers meet the demanding growth of unstructured data.

Enterprise Capacity 2.5 HDD

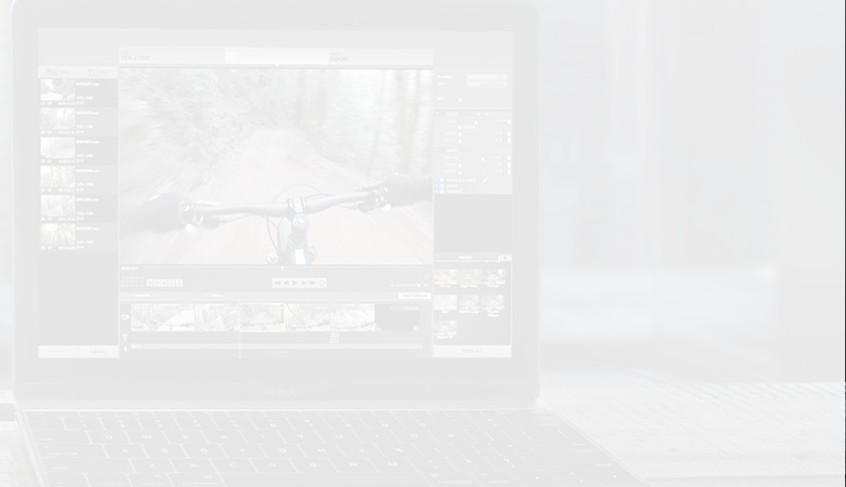
Up to 2TB

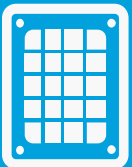
Store large amounts of mainstream data without using a ton of rack space or power.

Archive HDD

Up to 8TB

Affordable active archive hard drives perfect for backup and Cloud storage.





SSD

Enterprise-level data acceleration and quality

Nytrio® XF1230 SATA SSD

Up to 1.9TB

Improve storage performance and reliability for cloud servers and read-centric applications without requiring upgrades to SATA infrastructure.

Nytrio XP7102 NVMe Add-in Card

Up to 1.6TB

Boost performance and density for read-intensive and mixed workloads without raising TCO or expanding the storage footprint in data centers.

1200.2 SAS SSD

Up to 3.8TB

Next-generation high-capacity SAS SSD designed with multiple endurance offerings to match needs of a wide range of enterprise applications.

Nytrio XP6302 Flash Accelerator Card

Up to 3.5TB

Delivers the latest enhancements in PCIe® 3.0 and eMLC flash technology.

Nytrio XP7200 NVMe Add-in Card

Up to 8TB

Industry's highest bandwidth of 10GB/s per PCIe slot with four individually accessible volumes.

Nytrio XM/XF1440 NVMe SSD

Up to 1.9TB

Industry-leading balanced power/performance for increased storage density in data centers with M.2 and U.2 form factors.

Compute Roadmap – Enterprise Performance

High Performance & Reliability for Fast Data Delivery such as Databases, Search, File Serving, Email & HPC

		Features/ Proposition	Capacity	Formats	2017		
PERFORMANCE	2.5-inch Mission Critical	Compute workloads <ul style="list-style-type: none"> • 15K RPM • 12Gb/s SAS • Fast Format Feature • 2M Hr MTBF • SDR 315 MB/s • Random Read 400 IOPs • Random Write 700 IOPs • Op Power 6.90-7.60W • Base, SED or SED-FIPS* • Enhanced Cache feature 	900GB	512n 512e / 4Kn	Enterprise Performance 15K HDD v6		
			600GB	512n 512e / 4Kn	Enterprise Performance 15K HDD v6		
			450GB		EOL		
			300GB	512n 512e / 4Kn	Enterprise Performance 15K HDD v6		
			146GB		EOL		
			Compute workloads <ul style="list-style-type: none"> • 10K RPM • 12Gb/s SAS • 2M Hr MTBF • SDR 241 MB/s • Random Read 278 IOPs • Random Write 285 IOPs • Op Power 6.3-7.8W • Base, SED or SED-FIPS* • Enhanced Cache feature 	2.4TB 1.8TB	512e, 4Kn	Enterprise Performance 10K HDD v8	Ent Perf 10K v9
		1.2TB		512n, 512e, 4Kn	Enterprise Performance 10K HDD v8	Ent Perf 10K v9	
		900GB		512n, 512e, 4Kn	Enterprise Performance 10K HDD v8	Ent Perf 10K v9	
		600GB		512n	Enterprise Performance 10K HDD v8		
		300GB		512n	Enterprise Performance 10K HDD v8		

* Optional SED/FIPS models available on selected platforms

Storage Roadmap – Enterprise Capacity

High Capacity, Reliable Bulk Storage of unstructured cool data such as File Serving, Email & Data Back-up

		Features/ Proposition	Capacity	Format	2016	2017
CAPACITY	2.5-inch Nearline	<ul style="list-style-type: none"> Dense 2.5" footprint 7.2K RPM 12Gb/s SAS 6Gb/s SATA SDR up to 136MB/s, 130MiB/s Random Read 170 IOPs Op Power 4.74-6.02W 2M Hr MTBF Base, SED or SED-FIPS* 	2TB	512n 512e, 4Kn	Enterprise Capacity 2.5 HDD v3	
			1TB	512n 512e, 4Kn	Enterprise Capacity 2.5 HDD v3	
	3.5-inch Nearline	<ul style="list-style-type: none"> High performance, low power nearline 7.2K RPM 6Gb/s SATA & SAS 12Gb/s Helium (low weight, low power) SDR: 254MB/s, 243MiB/s Op Power 8.0 to 8.6W 2.5M Hr MTBF Enhanced Cache feature 	12TB 10TB	512e, 4Kn	Enterprise Capacity 3.5 HDD v6	
			8TB 6TB 4TB 3TB 2TB 1TB	512n, 512e, 4Kn	Enterprise Capacity 3.5 HDD v5	
			1TB 2TB	512n	Enterprise Capacity 3.5 HDD v5.1 (Only SATA, 1 / 2 TB and 512n)	

* Optional SED/FIPS models available on selected platforms

Capacity Optimized Roadmap – Archive, Value & Enterprise NAS

High Capacity, lowest \$/GB for Entry Level Server & Archival Storage of Cold Data

		Features/ Proposition	Capacity	Formats	2016	2017
Capacity Optimized	3.5-inch Value & Archive	Low cost nearline <ul style="list-style-type: none"> • 5.9K RPM • 6Gb/s SATA • 800K MTBF • 180TB/Yr WRL 	8TB	512e	Archive HDD (Drive Managed SMR)	
			8TB	512e	Archive HDD v2(Host Aware SMR)	
	3.5-inch Ironwolf Pro	NAS optimized <ul style="list-style-type: none"> • 7.2K RPM • 6Gb/s SATA • 1.2M Hr MTBF • 300TB/Yr WRL • Base: no encryption 	10TB, 8TB, 6TB, 5TB, 4TB, 3TB, 2TB	512e	Ironwolf Pro	



Barracuda ist zurück

... und jetzt mit neuen Freunden!!



THE
GUARDIAN SERIES

LEARN MORE AT SEAGATE.COM





BarraCuda: Zuverlässig und vielseitig für *geschäftliche oder private Anwendungen*

BarraCuda Pro: Leistungsintensive Desktop-Anwendungen für *Kreative (z.B. Foto, Videoschnitt)*

FireCuda: Höchste Leistung und Speicherkapazität für *Gamer* und *Enthusiasten*

Schnell. Vielseitig. Zuverlässig.



BARRACUDA
COMPUTE



Fast. Versatile . Dependable : Mainstream Roadmap

Leading areal density and Multi-Tier Caching enables the strongest client compute portfolio for PCs

Features/ Proposition		Capacity	Model Numbers	2016	2017
Portable	<ul style="list-style-type: none"> Highest 2.5" Capacity- 5TB Optimized for EB, Compute Low spin current options 2400 Hr POH Rating 	5TB	ST5000ML000	Laptop HDD	BarraCuda
		4TB	ST4000ML024	Laptop HDD	BarraCuda
		3TB	ST3000ML024	Laptop HDD	BarraCuda
	<ul style="list-style-type: none"> Industry's only 1TB/D All 7mm 500-2TB Fast Throughput 140MB/s Lightest weight <85gm Low idle power <0.5W MTC Technology™ 	2TB	ST2000LM015	Momentu s 9.5mm Laptop Thin HDD	BarraCuda
		1TB	ST1000LM048	Momentu s 9.5mm Laptop Thin HDD	BarraCuda
		500 GB	ST500LM030	Laptop HDD	BarraCuda
Desk-based	<ul style="list-style-type: none"> Leading Areal Density 4TB 7200 RPM Options 20mm Low Profile (1/2TB) Self-Encrypting Drive (1/2TB) MTC Technology™ 	4TB	ST4000DM005	Desktop HDD	BarraCuda
		3TB	ST3000DM008	Desktop HDD	BarraCuda
		2TB	ST2000DM006	Desktop HDD	BarraCuda
		1TB	ST1000DM010	Desktop HDD	BarraCuda
		500GB	ST500DM009	Desktop HDD	BarraCuda



Fast . Versatile . Dependable : Performance Roadmap

Unsurpassed Premium Performance with Flash Acceleration, suited for audiences like Creative Pros, Gamers

Features/ Proposition		Capacity	Model Numbers	2016	2017
Desk-based BarraCuda Pro	<ul style="list-style-type: none"> • Best Drive for Creative Pros • 300TB/Yr Workload • 8760 Hr Operation • 5-Year Warranty • Fastest IOPS, as 220MB/s • 2 year SRS 	10TB	ST10000DM0004		BarraCuda Pro
		8TB	ST8000DM005	Desktop HDD	BarraCuda Pro
		2-6TB	Multiple	Desktop HDD	BarraCuda Pro
Desk-based FireCuda	<ul style="list-style-type: none"> • Flash + HDD for fast perf • 8GB Flash • PCMark 5x Mainstream • Great for DT gaming • 5 year warranty 	2TB	ST2000DX002	Desktop SSHD	FireCuda
		1TB	ST1000DX002	Desktop SSHD	FireCuda
Portable 7200	<ul style="list-style-type: none"> • 7200 RPM • Optimized for PC Usage 	1TB	ST1000LM044		
		500GB	ST500LM021		Laptop Thin HDD
Portable FireCuda	<ul style="list-style-type: none"> • Flash + HDD for fast perf • 8GB and 32GB Flash • PCMark 5x Mainstream • Apps load 450% faster • Ideal for Gaming • 5 year warranty 	2TB	ST2000LX001		FireCuda 7mm
		1TB	ST1000LM014	Laptop SSHD	FireCuda 7mm
		500GB	ST500LM000	Laptop SSHD	FireCuda 7mm



SKYHAWK
SURVEILLANCE





- ① **10** Jahre "Surveillance" Erfahrung. **7.** Produkt-Generation.
- ② unterstützt bis zu **64** Kameras
- ③ **3x höherer Workload** für größere Anzahl an HD-Videos, längere Speicherzeiten
- ④ Optimiert für **90% Schreiben** und **10% Lesen**
- ⑤ **ImagePerfect** Firmware optimiert für den 24/7 Überwachungsbereich





Smart . Safe . Secure

Reliable data storage enhanced with ImagePerfect video storage solution for upto 64 camera recording



Features/ Proposition	Capacity	Model Numbers	2016	2017
SkyHawk <ul style="list-style-type: none"> • 10 years of purpose-built drives • NVR –Ready • 180TB/Y workload • Upto 64 cameras supported • ImagePerfect Firmware 	10TB	ST10000VX0004		SkyHawk
	8TB	ST8000VX022	Surveillance HDD	SkyHawk
	6TB	ST6000VX023	Surveillance HDD	SkyHawk
	4TB	ST4000VX007	Surveillance HDD	SkyHawk
	3TB	ST3000VX010	Surveillance HDD	SkyHawk
	2TB	ST2000VX008	Surveillance HDD	SkyHawk
	1TB	ST1000VX005	Surveillance HDD	SkyHawk



IRONWOLF
NAS





IronWolf: RAID-optimiert, hochzuverlässiger Speicher für *vernetztes Zuhause, SOHO und SMB* NAS Systeme.

IronWolf Pro: Entwickelt für maximale Stabilität bei hoher Auslastung in Unternehmen. Für *mittlere- bis große NAS Umgebungen.*

Robust. Verfügbar. Skalierbar.





Tough . Ready . Scalable
 AgileArray with state of the art RAID and multi-user optimization

	Features/ Proposition	Capacity	Model Numbers	2016	2017
IronWolf Pro	<ul style="list-style-type: none"> AgileArray™ for the best RAID performance Upto 16-bay usage 300TB/Y RV Sensors 2 year SRS 5-year Warranty 	10TB	ST10000NE0004		IronWolf Pro
		8TB	ST8000NE0021		IronWolf Pro
		6TB	ST6000NE0021		IronWolf Pro
		4TB	ST4000NE0025		IronWolf Pro
		2TB	ST2000NE0025		IronWolf Pro
IronWolf	<ul style="list-style-type: none"> AgileArray™ optimization Upto 8-bay usage 180TB/Y RV Sensors 3-year Warranty 	10TB	ST10000VN0004		IronWolf
		8TB	ST8000VN022	NAS HDD	IronWolf
		6TB	ST6000VN041	NAS HDD	IronWolf
		3-4TB	Multiple	NAS HDD	IronWolf
		2TB	ST2000VN004	NAS HDD	IronWolf
		1TB	ST1000VN002	NAS HDD	IronWolf



- ① **IHM** für einen zuverlässigen NAS Betrieb
- ② **RV Sensoren** für Vibrationsausgleich
- ③ bis zu **300 TB/Jahr** Workload
- ④ optimiert für **50% Schreiben** und **50% Lesen**
- ⑤ bis zu **5 Jahre Garantie / Rescue Service**



10TB - Guardian Series compared to Enterprise Nearline

The Right Drive for the Right Application!

	BarraCuda Pro	IronWolf	IronWolf Pro	SkyHawk	Hyperscale NL	Traditional NL
Use Case	Single Drive Creative Pro	≤ 8 bay NAS	≤ 16 bay NAS	Surveillance DVR & NVR 90% Seq Write	Cloud DC Optimized for large transfers	Traditional IT Optimized for short transfers
Warranty	5	3	5	3	5	5
MTBF	1.0M	1.0M	1.2M	1.0M	2.5M	2.5M
Workload	300	180	300	180	550	550
SDR (MB/s)	210	210	214	210	249	249
Latency	N/A	N/A	N/A	N/A	99.99% ≤ 50ms	99.99% ≤ 50ms
mDRAM	No	No	Yes	No	No	Yes
Interface	SATA, 512e	SATA, 512e	SATA, 512e	SATA, 512e	SATA, 5xxe	SATA/SAS, 4KN, 5xxe
Security	No	No	No	No	SED	SED, FIPS

Positionierung

Anwendung und Preisbildung

Single User



Mainstream
\$

Leistung,
Zuverlässigkeit



Gaming, Upsell
\$\$\$\$



Kreative, Profis
\$\$\$\$\$



Überwachung
\$\$

Multiple User



NAS 1-8 Schächte
\$\$\$

Leistung,
Zuverlässigkeit



NAS für große Unternehmen
\$\$\$\$\$\$



IRONWOLF

Health Management



1

Prävention



IHM überwacht die Benutzerumgebung und empfiehlt Präventivmaßnahmen für einen sicheren NAS-Betrieb.

2

Intervention



Analysiert hunderte von Parametern und empfiehlt Backup-Maßnahmen zur Vorbeugung gegen gravierende Datenverlustfälle.

3

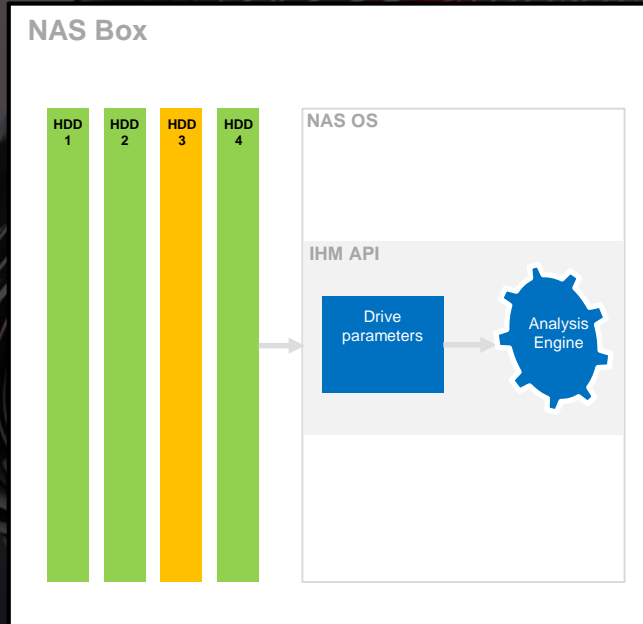
Wiederherstellung



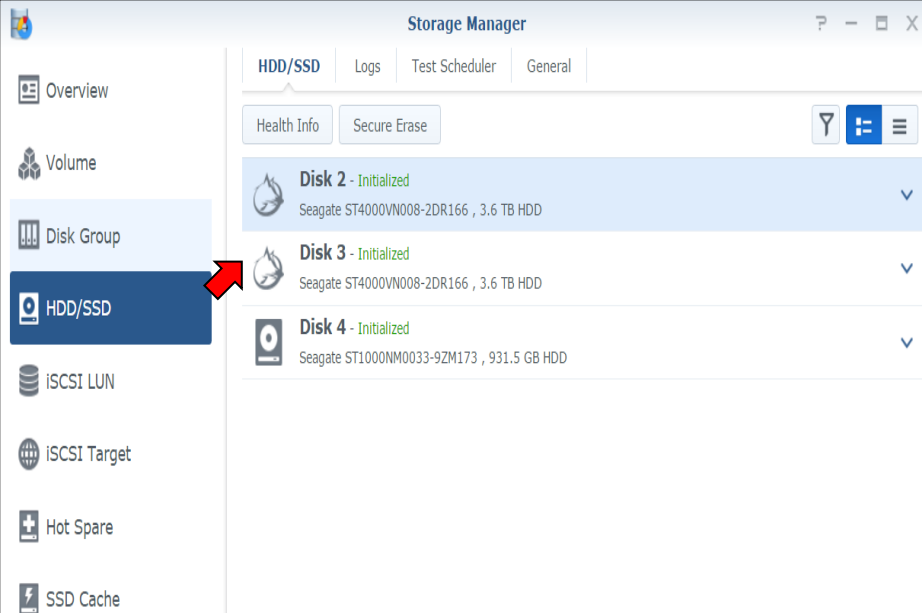
Der Zugriff auf die Seagate® Data Recovery Services garantiert eine sichere Umgebung zur Datenwiederherstellung im Falle eines Datenverlusts.

(Laufzeit von zwei Jahren im Lieferumfang der IronWolf Pro enthalten)

Übersicht der Architektur und Funktionsweise des IHM



Storage Manager



The screenshot shows the 'Storage Manager' interface. The left sidebar has 'HDD/SSD' selected, indicated by a red arrow. The main panel shows 'HDD/SSD' with tabs for 'Health Info' and 'Secure Erase'. Under 'Health Info', three disks are listed:

- Disk 2 - Initialized**
Seagate ST4000VN008-2DR166, 3.6 TB HDD
- Disk 3 - Initialized**
Seagate ST4000VN008-2DR166, 3.6 TB HDD
- Disk 4 - Initialized**
Seagate ST1000NM0033-9ZM173, 931.5 GB HDD



Ironwolf Health Management ergänzt und erweitert SMART erheblich!

SMART

- Überwacht 20 Festplatten Parameter
- Zeigt "PASS" oder "FAIL" Status
- Abruf von 20 Parameter über den Festplattenzustand
- Hat keine Historie früherer Verletzungen der Schwellenwerte

IronWolf Health Management

- Überwacht mehr als 200 Parameter die das Laufwerk beeinträchtigen könnten
- Benachrichtigt Benutzer über mögliche Präventions und Eingriffs Maßnahmen BEVOR ein Fehlerhafter Status möglicherweise auftritt. Dadurch wird die Wahrscheinlichkeit eines Datenverlustes oder Komplette Ausfalls deutlich minimiert.
- Abruf von 200 Parametern über den genauen Festplattenzustand, erweiterte Berichte für eine genaue Analyse (für Seagate RMA Service)
- Speichert historische Ereignisse für Trend Analysen und berücksichtigt externe Einwirkungen für die Lebensdauer des Laufwerkes.

Das
umfangreichste
Portfolio der
Welt

Danke!



BARRACUDA
COMPUTE



IRONWOLF
NAS



SKYHAWK
SURVEILLANCE

*For questions about its contents, please
contact*

Sascha.bosen@seagate.com