



IBM System Storage™ N series – Unified Storage Solutions

IBM System Storage™ New N6000 series



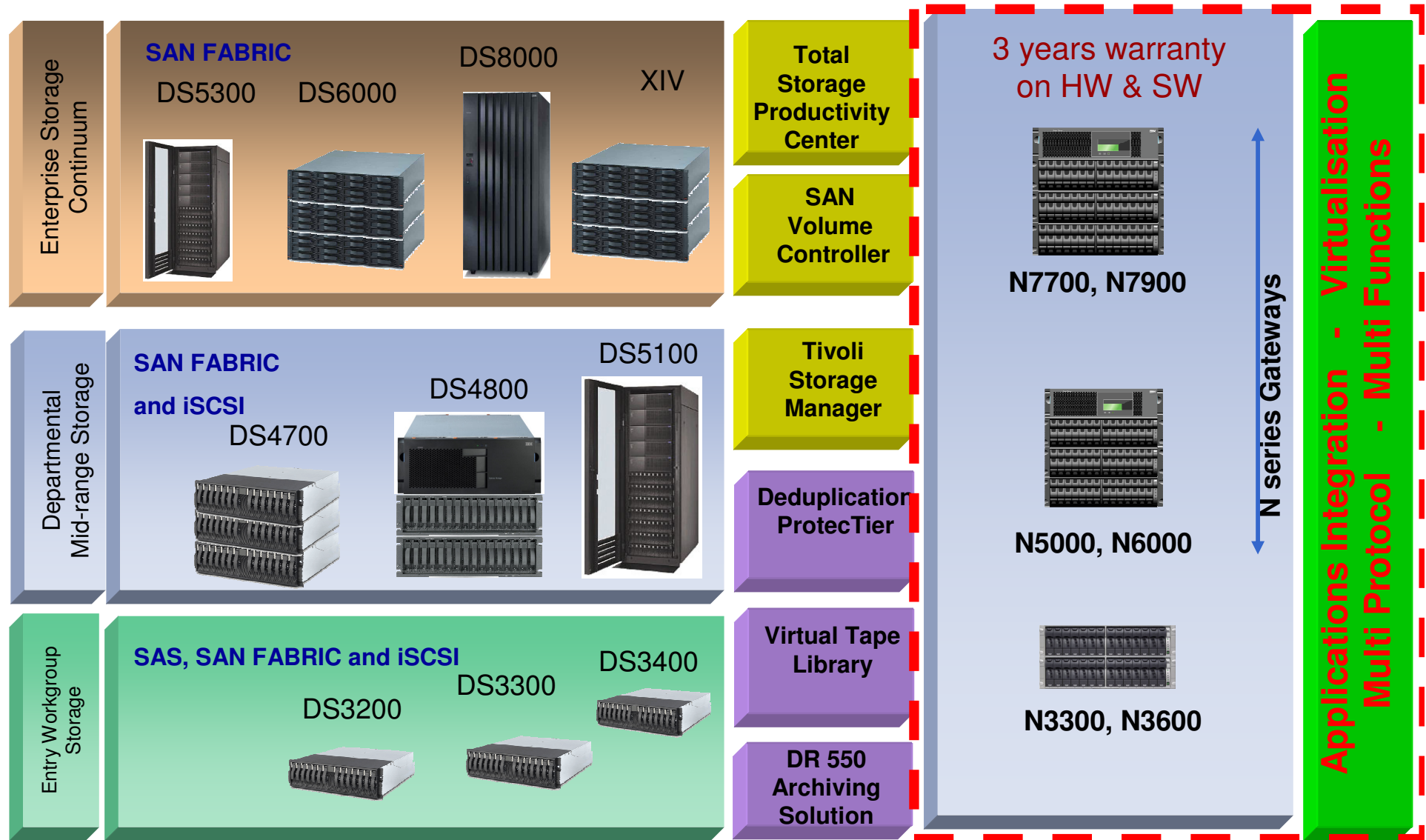
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Agenda

- **N series positioning**
- **N6000 series featuring Data ONTAP**
- **N6000 – highlights, key features, specifications, benefits, etc.**
- **Competitive alignment**
- **Summary**

Positioning N series within IBM System Storage Family



N6000 series Storage Systems featuring Data ONTAP

N series....



- Compelling *performance* across several storage workloads
- *Respond quickly to growth* with easy upgrades to more powerful N series systems
- Provides the *flexibility* to meet your diverse and changing needs – unified storage platform providing simultaneous block and file services
- Increases the *availability* of your data *and* applications
- *Efficient* storage utilization dramatically reduces consumption of raw storage, power, cooling and space

Also available as the N6000 series Gateway storage systems!

What is new with the N6000 Storage System?

Key Features of the N6000 series:

- Improved performance across a wide range of storage workloads
- Improved scalability – N series midrange now scales to 840 drives & 840TB capacity
- Greater I/O expandability - Now up to 8 PCIe I/O slots
- Easy upgrade to dual controller config with new single 6U Chassis

We didn't change anything with the N6000 that we know you love:

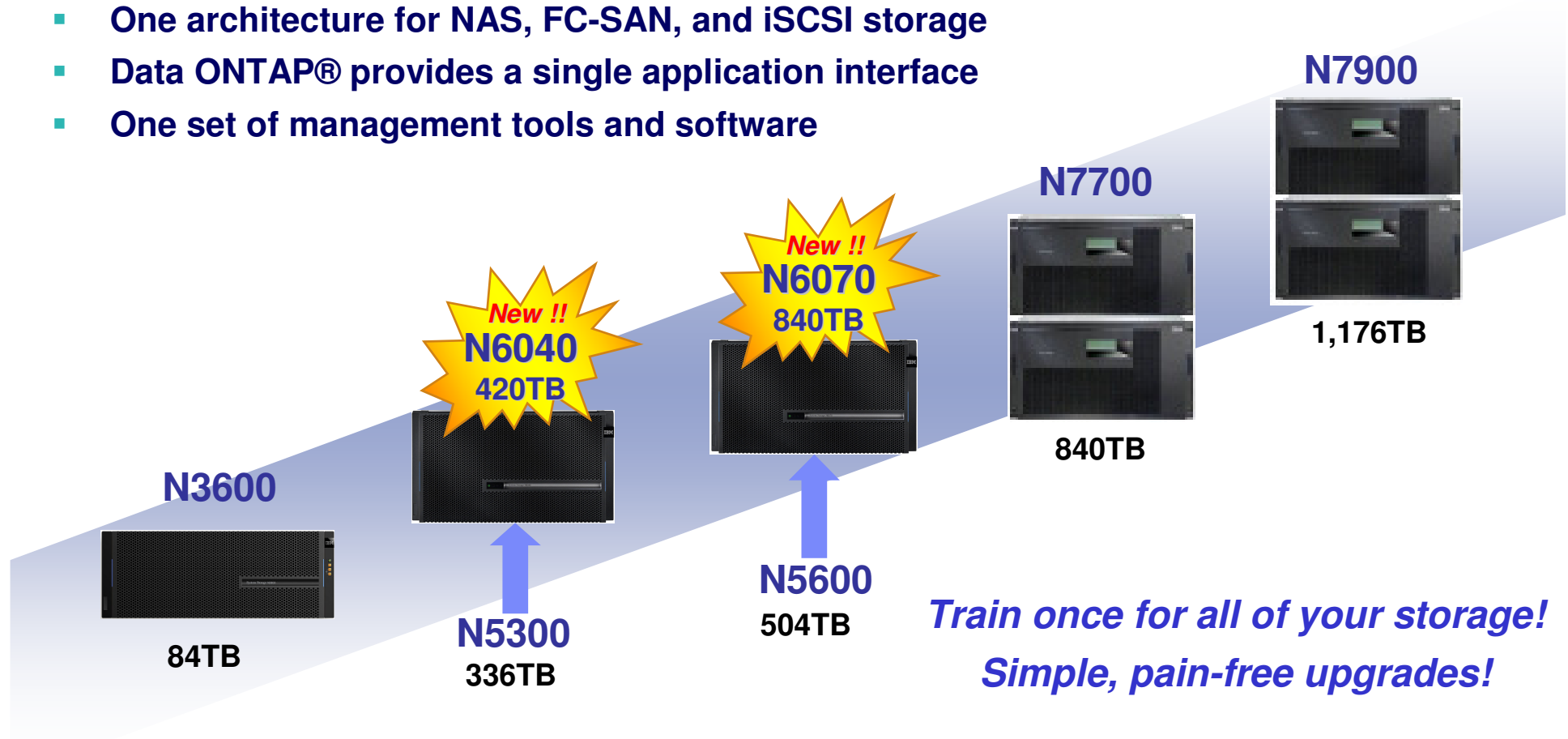
- Storage tiering with FC and SATA drives
- Integrated remote management
- Integrated 4Gb/s Fibre Channel
- 64-bit controller architecture with high-bandwidth I/O design



IBM System Storage N6000 series

New midrange products with the same N series functionality

- New N6000 products are direct replacements for N5300 and N5600
- One architecture for NAS, FC-SAN, and iSCSI storage
- Data ONTAP® provides a single application interface
- One set of management tools and software



The new N6000 series consist of two products: **N6040 and N6070**

N6000 gateway models available too by adding a gateway feature identifier on the appliance models.



N6070



N6040

Maximum raw capacity	840TB	420TB
Maximum disk drives	840	420
Controller architecture	64 bit	64 bit
Controller form factor	1 or 2 controllers in a single 6U chassis	1 or 2 controllers in a single 6U chassis
Memory	32GB	8GB
Maximum 4Gbps FC ports	40	40
Maximum Ethernet ports	36	36
Storage Protocols	FCP, iSCSI, NFS, CIFS	FCP, iSCSI, NFS, CIFS

- All specifications are for dual-controller, active-active configurations
- Maximum ports combines integrated ports with I/O expansion cards

Key N6000 series features

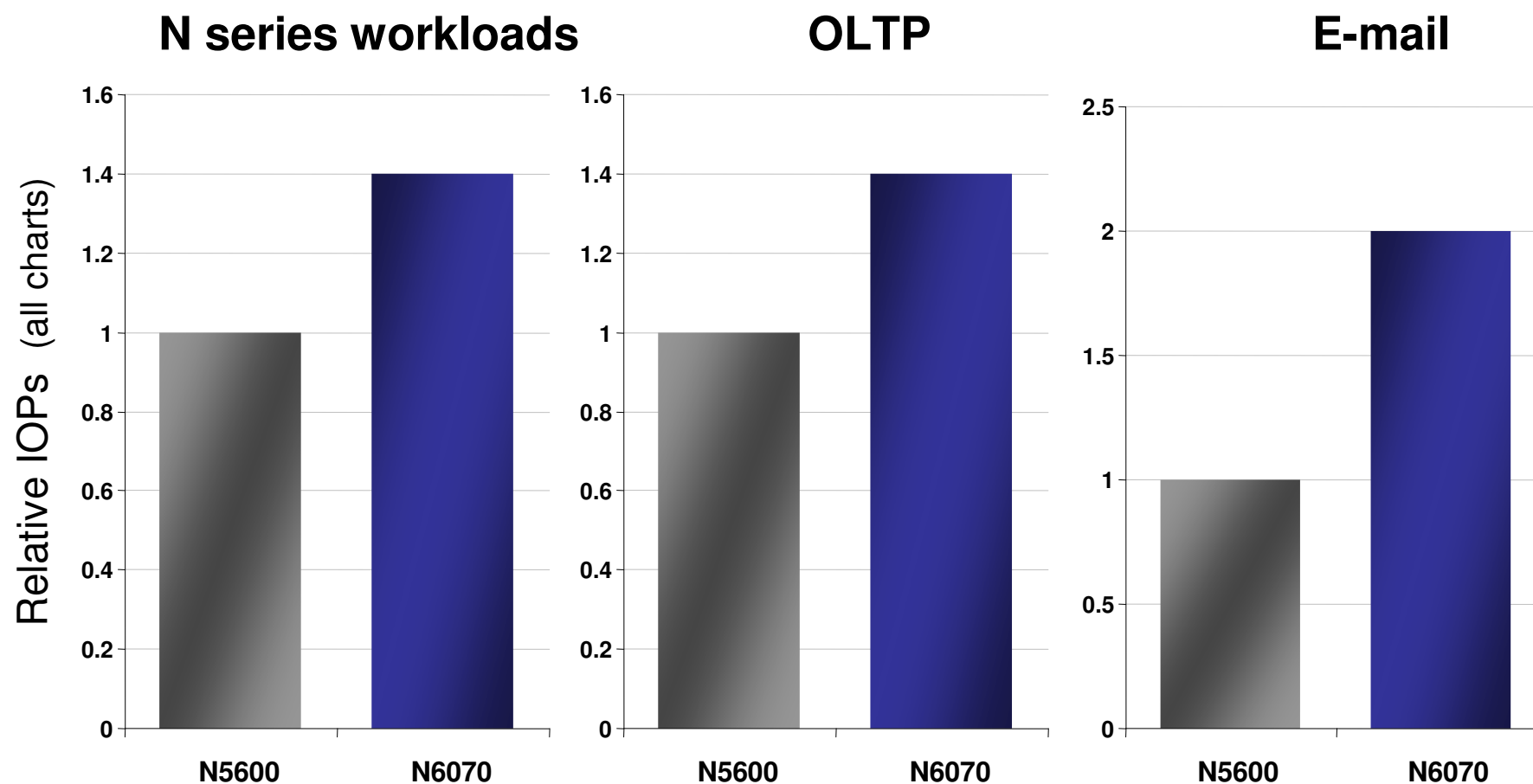
Comparison Table

	N5200	N5300	N6040	N5600	N6070
Processors	2 x 32-bit (2 single-core)	4 x 64-bit (4 single-core)	2 x 64-bit (2 dual-core)	4 x 64-bit (4 dual-core)	4 x 64-bit (4 dual-core)
Memory	4 GB	8 GB	8 GB	16 GB	32 GB
Rack Space	6U (2x 3U)	6U (2x 3U)	6U (1x 6U)	6U (2x 3U)	6U (1x 6U)
Expansion Slots	6 x PCI-X	6 x PCIe	8 x PCIe	6 x PCIe	8 x PCIe
Onboard I/O	8 x GbE 8 x 2Gb FC	8 x GbE 8 x 4Gb FC	4 x GbE 8 x 4Gb FC	8 x GbE 8 x 4Gb FC	4 x GbE 8 x 4Gb FC
Max Disk Drives	168	336	420	504	840
Max Capacity	84TB	336TB	420TB	504TB	840TB
Operating System	7.0 +	7.2.1 +	7.2.5 +	7.2.1 +	7.2.5 +

- All figures are for dual-controller, active-active configurations
- Items highlighted with light blue fill represent new functionality over prior generation

Relative Performance

N6000 Systems¹



¹ Results are based on performance testing conducted by the OEM vendor using OEM equivalent of IBM N series products. IBM branded systems are intended to have similar performance.

IBM® System Storage™ N series

Delivering value across the datacenter...

Highly-scalable storage systems designed to meet the needs of large enterprise data centers.

- Lower acquisition and administrative costs than traditional large-scale enterprise storage systems
- Seamless scalability, mission critical availability, and superior performance for both SAN and NAS operating environments



Excellent performance, flexibility, and scalability all at a proven lower overall TCO

- Highly efficient capacity utilization
- Comprehensive set of storage resiliency features including RAID 6 (RAID-DP™)



Entry level pricing, Enterprise Class Performance

- Centralize Storage in Remote & Branch Offices
- Easy-to-Use Back-up and Restore Processes



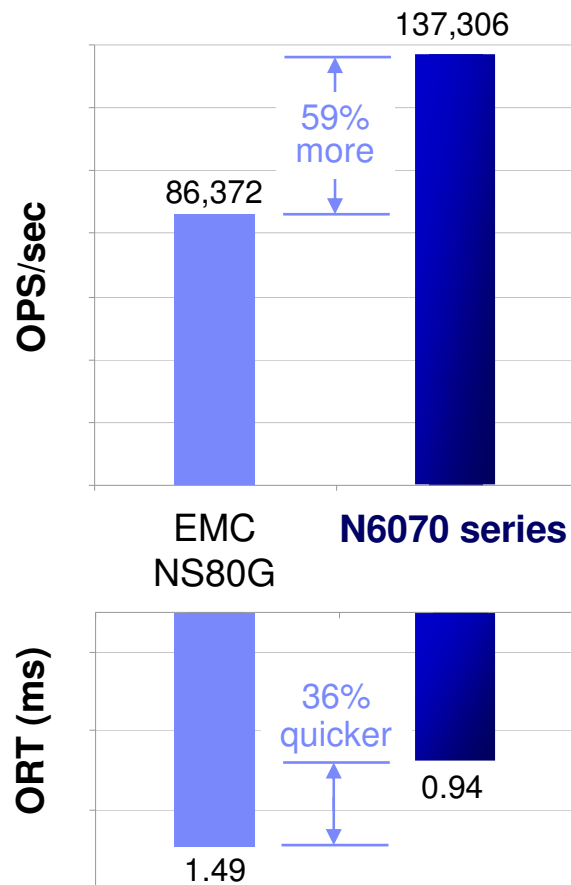
N series Gateways

Leverage existing Storage Assets while introducing advanced N series Software functionality

N series Storage Architecture provides unmatched simplicity

N5300 will be replaced by N6030 and N5600 will be replaced by N6070

N6070 series outperforms EMC Celerra NS80G by 59% in File Serving Benchmark



Workload

- SFS97_R1 benchmark represents file services N series based workloads

Results

- New N6070 series achieved **59%** better throughput (OPS/sec) than EMC Celerra NS80G
- A low response time (ORT) is just as critical as throughput to many customers – *N6070 series delivers **36%** quicker response time (sub-millisecond!) than EMC Celerra NS80G*

Notes

OPS/sec = Operations per second as measured in SFS97_R1.v3 benchmark

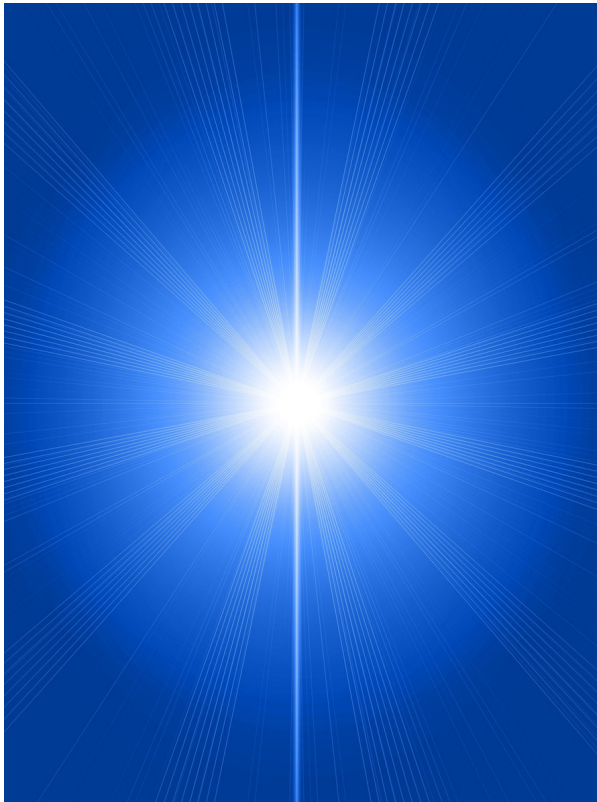
ORT = Overall response time as measured in SFS97_R1 benchmark

SPEC® and the benchmark name SPECsfs97_R1® are registered trademarks of the Standard Performance Evaluation Corporation. The results above are based on a performance testing conducted by the OEM vendor using OEM equivalent of IBM N series products. IBM branded systems are intended to obtain similar performance.

<http://www.spec.org/sfs97r1/results/res2006q4/sfs97r1-20061120-00273.html>

Data ONTAP 7G

Scalable and Flexible Storage Operating System for Enterprise Data Management



Data ONTAP has Powerful Capabilities:

- Instant application-level backup and recovery (Snapshot™ , SnapManager®)
- Superior storage utilization and thin provisioning (FlexVol®)
- Rapidly, or even automatically, provision storage
- Instantly clone (FlexClone®)
- Prioritize workloads (FlexShare™)

N6000 series provides end to end Data Protection solutions

- ***Covering the spectrum of Backup and Recovery to Business Continuity***
- **Data Protection**
 - MetroCluster
 - ReplicatorX™
 - Open Systems SnapVault®
 - SnapMirror®
 - SnapRestore®
 - SnapVault
 - Snapshot™ capabilities in Data ONTAP®
- **Data Retention**
 - SnapLock®
 - LockVault™

Do more within your budget, staff, and infrastructure constraints

Innovative Software Technology to Maximize Storage Efficiency



Save
up to
95%

Deduplication

Saves up to 95% for full backups;
25% to 55% for most data sets.



Save
over
80%

Snapshot™ Copies

Savings equal the portion of
data set not changed since
last copy was made.



Up to
46%

RAID 6 (RAID-DP®)

Saves up to 46% versus
mirrored data or RAID 10.



Save
over
80%

Writable Snapshot (FlexClone®) Copies

Savings equal size of original
data set minus blocks
subsequently changed in
clone.



33%

Thin Provisioning (FlexVol®)

20% to 33% typical savings.

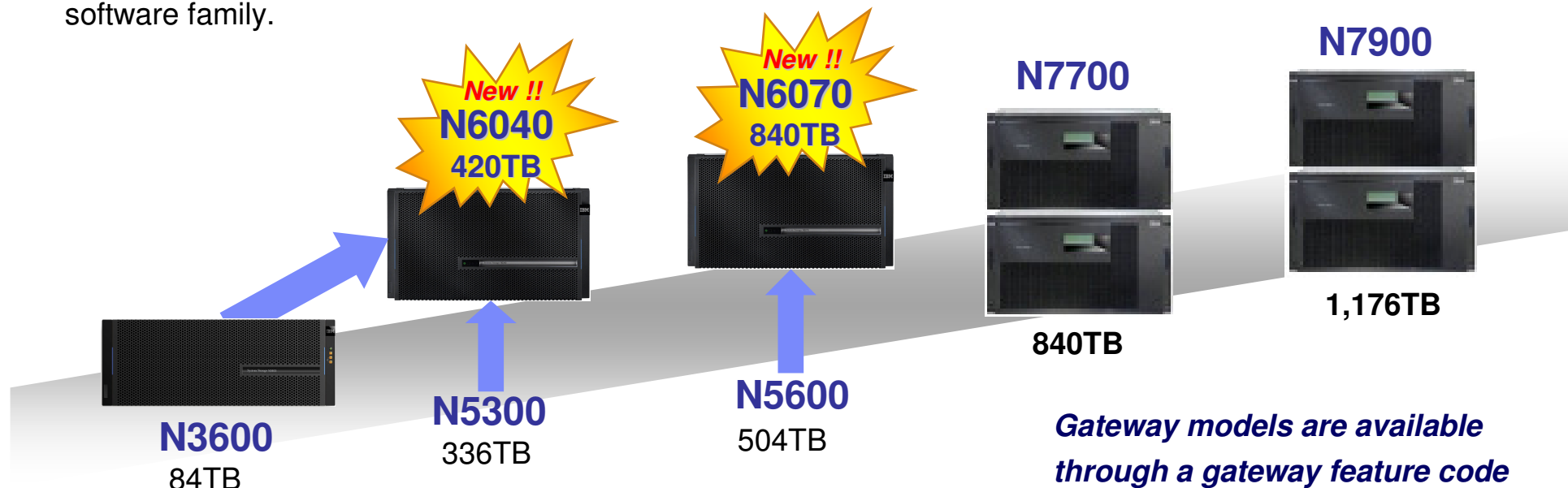
***Savings compound when
using multiple features!***

New N6000 series gateway overview

Expanding the fastest growing IBM disk storage family

Transform Legacy Storage

N6000 series gateway virtualizes SAN storage from multiple vendors into a single pool for file or block access to provide the benefits of Data ONTAP® and the N series manageability software family.



Tiered Heterogeneous Storage



HITACHI
DATA SYSTEMS



EMC²
where information lives®

FUJITSU

3PAR
Serving Information

Competitive Alignment

N6000 is Unmatched in Unified Storage

	N6000	EMC Midrange	HP Midrange
File I/O Protocols	Yes, NFS, CIFS	None	None
Block I/O Protocols	Yes, FCP, iSCSI	Yes, FCP, iSCSI	No, FCP
Max Capacity	840TB	Varies	Varies
RAID-DP™ (RAID 6)	YES	Yes	No
Low-overhead Snapshot™ Copies	YES	Yes	No
Max Snapshot copies	255 per LUN	300	~16,000?
Thin Provisioning	YES	Yes	No
Deduplication	YES	Yes	No

- Unified Storage provides versatility multi-protocol environments
- RAID-DP provides superior data protection with no performance loss
- Unmatched Snapshot and thin provisioning capabilities

Remote Support Agent Features

- **Core handling**
 - Ordering parts replacement is handled by IBM L1 support manually
- **Down application notification**
 - Upload the coredump is handled by IBM PFE support
- **Integrated with AutoSupport features & functionality**
 - It can be enabled and configured to send autosupport report to the customer and also to IBM
- **No additional box or phone line required !!!**

The N6000 series Storage Systems featuring Data ONTAP



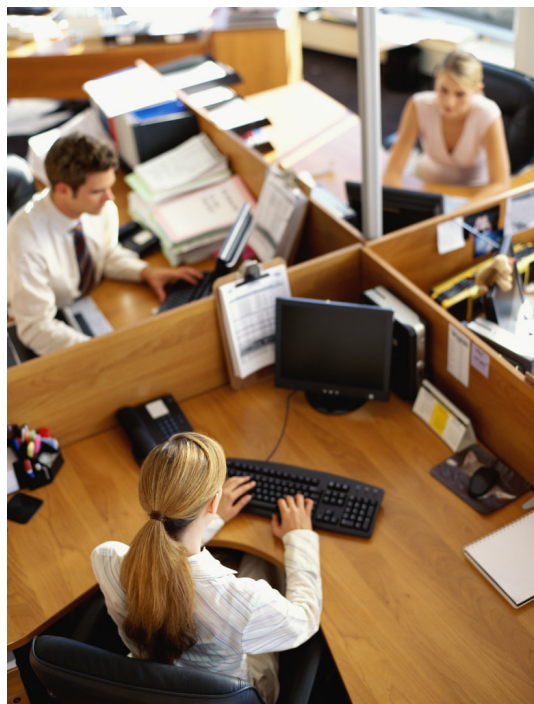
- **Summary points:**
 - Compelling **performance** across several storage workloads
 - Respond **quickly to growth** with easy upgrades to more powerful N series systems
 - Provides the **flexibility** to meet your diverse and changing needs – unified storage platform providing simultaneous block and file services
 - Increases the **availability** of your data and applications
 - Efficient storage utilization **dramatically reduces** consumption of raw storage, power, cooling and space

IBM Warranty and Support



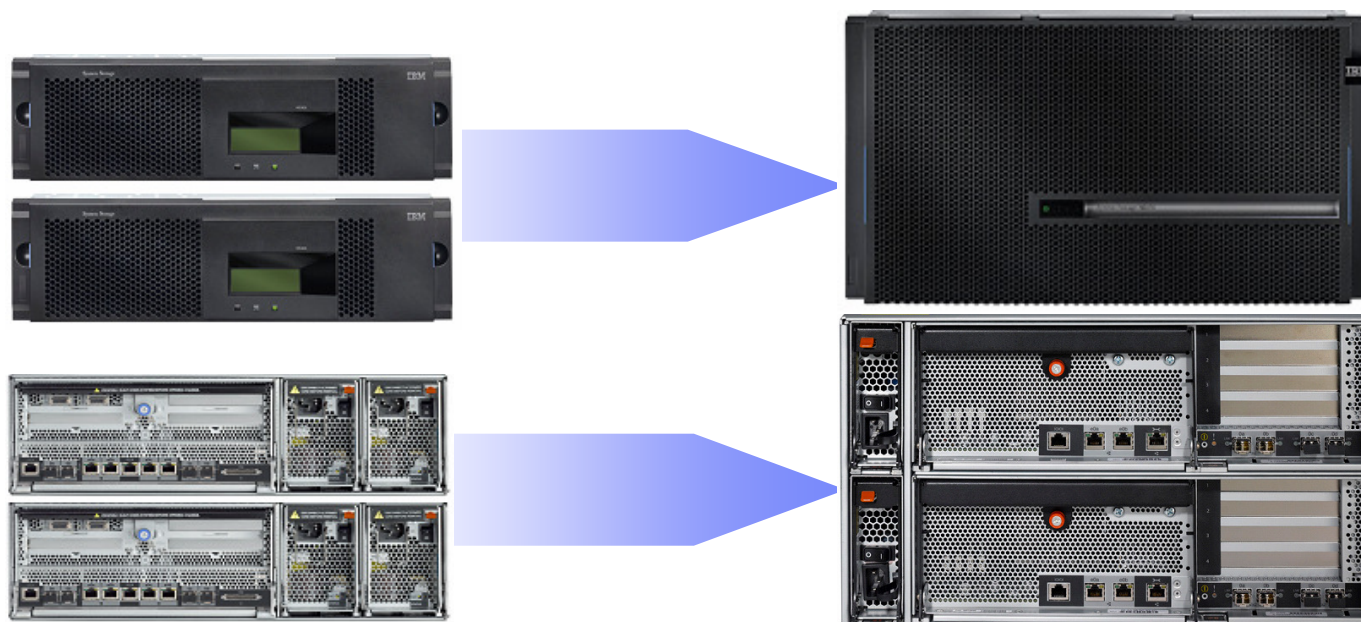
Standard Warranty period:

- 3 years for hardware and licensed software, 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- Licensed software examples; Snapshot, SnapRestore, FlexVol, FlexClone, etc. (see N series Quick Reference Guide for standard and optional software feature licenses).
- Warranty service upgrades are available with this product.
- The warranty terms and conditions are based on the machine type model number (MTM) and serial number (S/N).



Thank You
for Your Attention

N6000 series form factor optimized for High Availability configurations



- **New N6000 6U chassis supports twin controllers**
 - Active-Active configuration in a **single 6U chassis**
 - Backplane reduces external cabling
 - Fewer power cables
 - Active-Active config within chassis no longer requires heartbeat cable
 - Easy upgrade from single controller config to A-A config - just plug in new controller

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