Aktuelle Entwicklungen im Speicherumfeld

IBM Spectrum Storage

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Business Development High End Disk Systems, DACH
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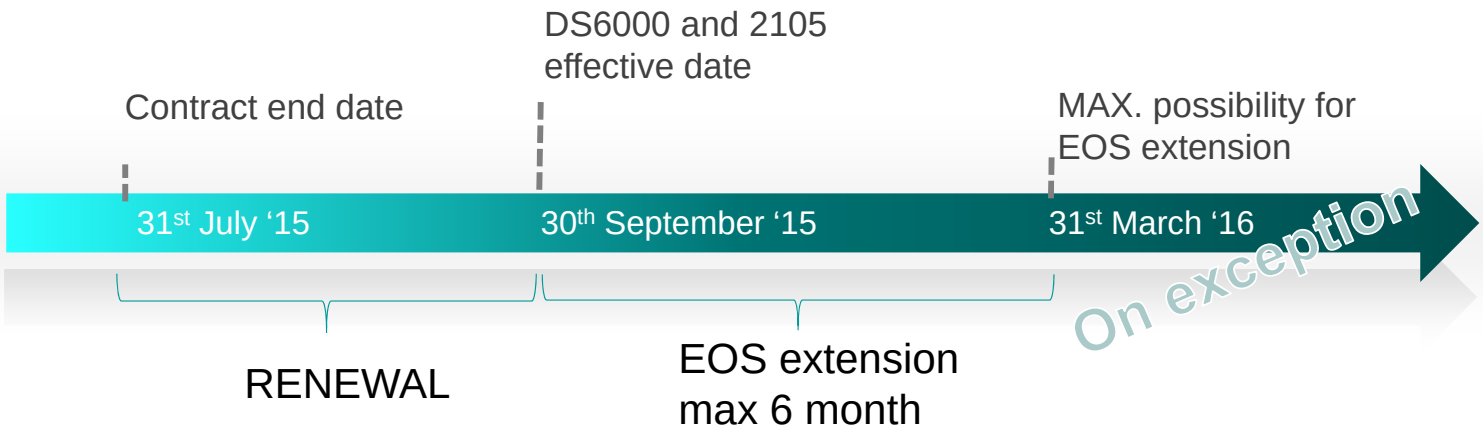
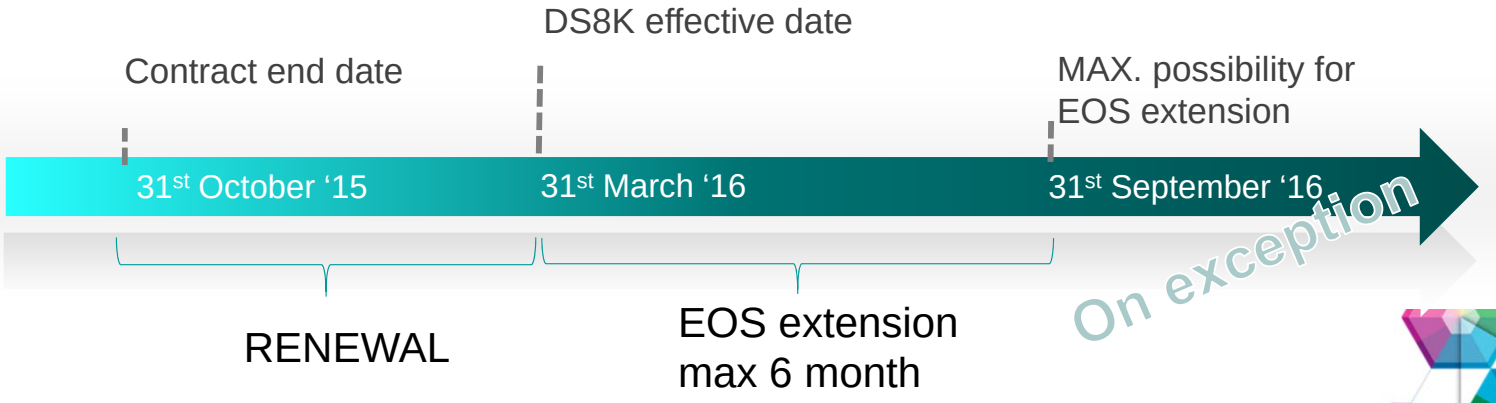
Extension possibilities

DS6K



DS8K



Agenda

- The storage industry, market trends and directions
- IBM's answer: IBM Spectrum Storage
- Systems for the storage backend

The Storage Industry 2015: Where are we going…

*"The **transformation of the storage industry continues**, with new technologies and business models **disturbing the market at the magnitude not seen since the invention of network storage**."*

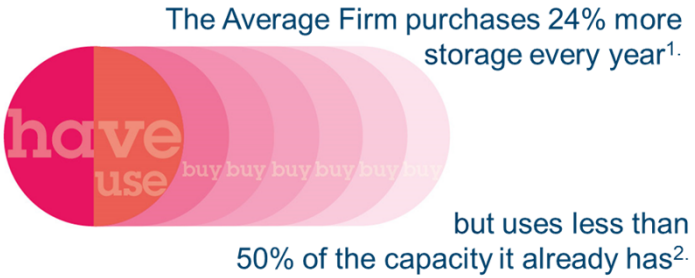
IDC: Worldwide and U.S. Enterprise Storage Systems 2014–2018 Forecast

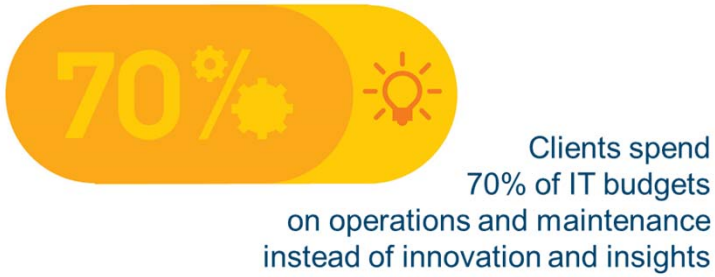
- Quick proliferation of the "3rd platform"
- IT spending growth will be focused on 3rd Platform*
- Workloads move to hyperscale datacenters operated by cloud service providers*

*Source: IDC top ten predictions for the worldwide information and telecommunications technology (ICT) industry in 2015

The Storage Industry 2015: Customers' situation…

- **Customers struggle with the economics of established Storage Environments**
- **Meeting rising Service Levels while freeing up budget** to build 3rd platform
- Demand for **new, more economic storage infrastructures** for traditional 2nd platform legacy systems
- Most promising technology to raise storage economics is **Storage Virtualization.**



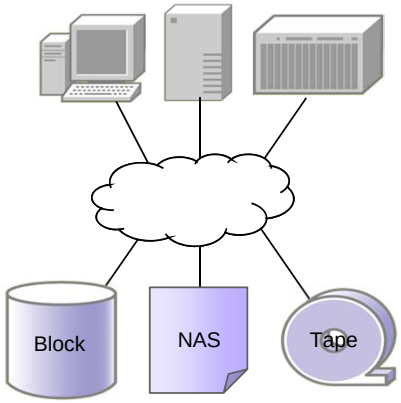


1. Storage Study: Wave 17, TheInfoPro, 451 Research
2. IBM Storage Infrastructure Optimization Studies

Two worlds in storage…

grey zone

Better economics for **classic** infrastructures

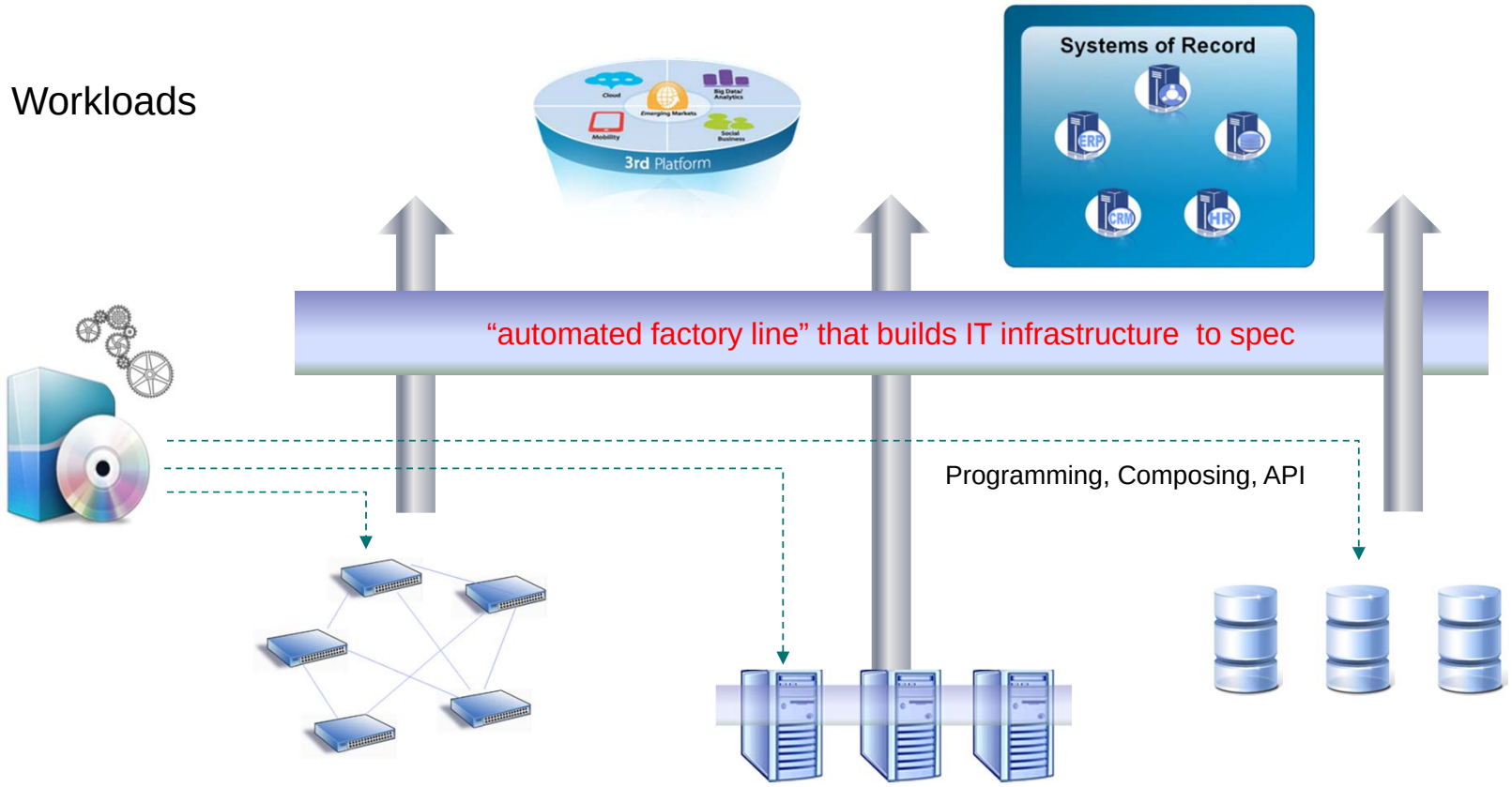


Transactional IT
Banking, Finance
ERP (SAP, …)
traditional Microsoft
SQL Analytics
…

Flexible & reliable scale-out technologies for **grids**

Web Scalability IT
Web applications
Media archives
Sync & share
Hadoop Analytics
…

Software Defined Environments – Focus on Automation



"ability to dynamically compose a service, on demand, and under programmatic control"

Software Defined Storage (I)

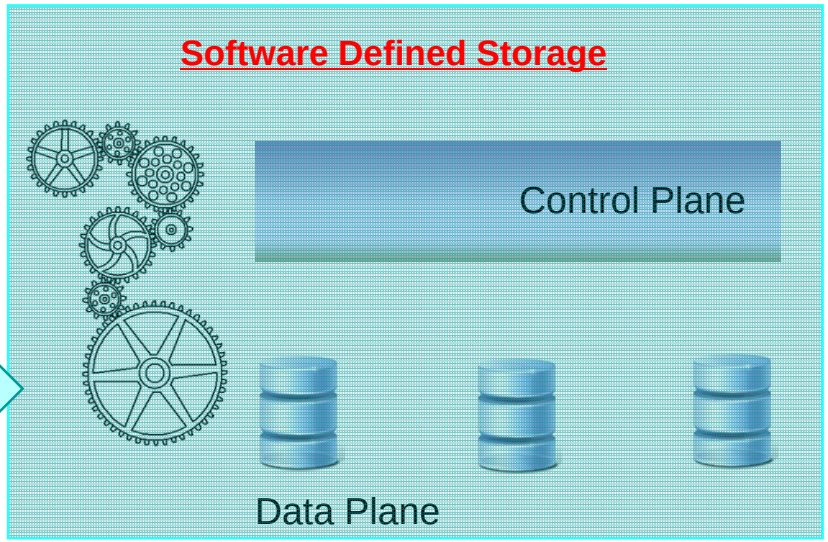
I need some storage for my Application:

- 1TB
- Performance = 100.000 Iops
- RPO/RTO
- Latency = 95% < 4ms
- Secuity = On
- Backup = 1h

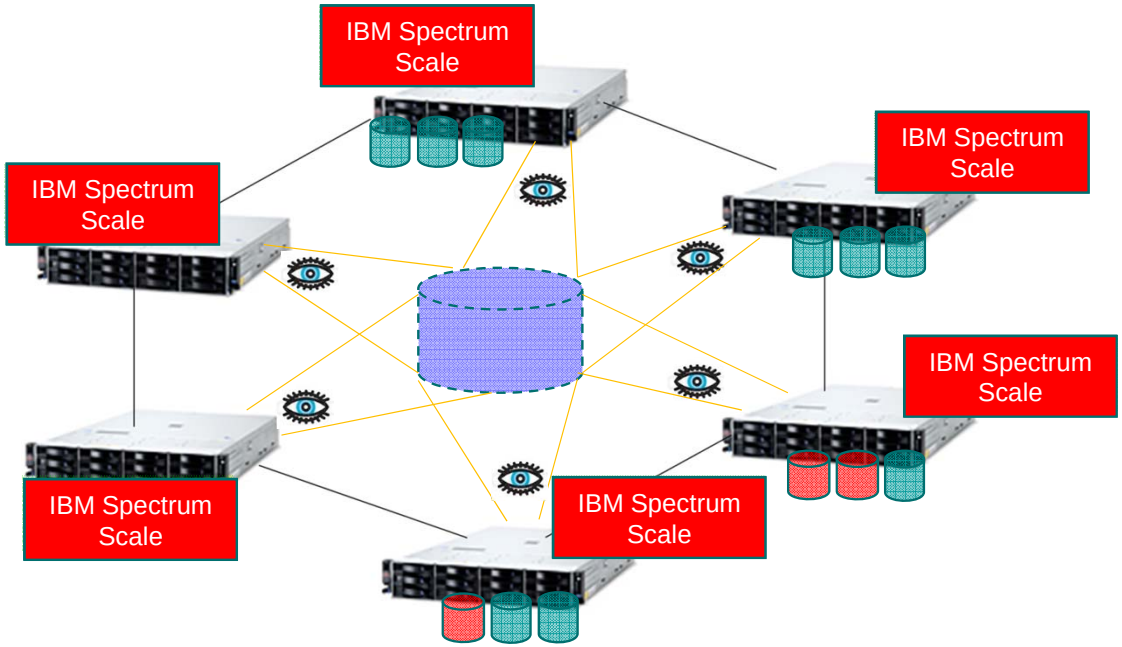
DO IT!

DONE!

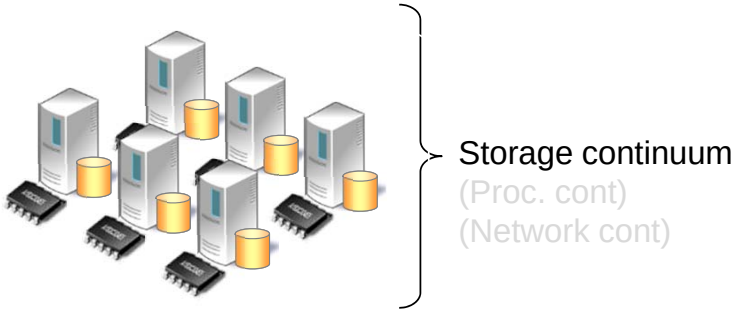
- Orchestrate to meet SLA
- Watch and adjust
- New SLA? Be adaptive!



Software Defined Storage (II)



Hyperconverged system: "a software that transforms all my server's resources into a continuum" (storage, network & cpu)



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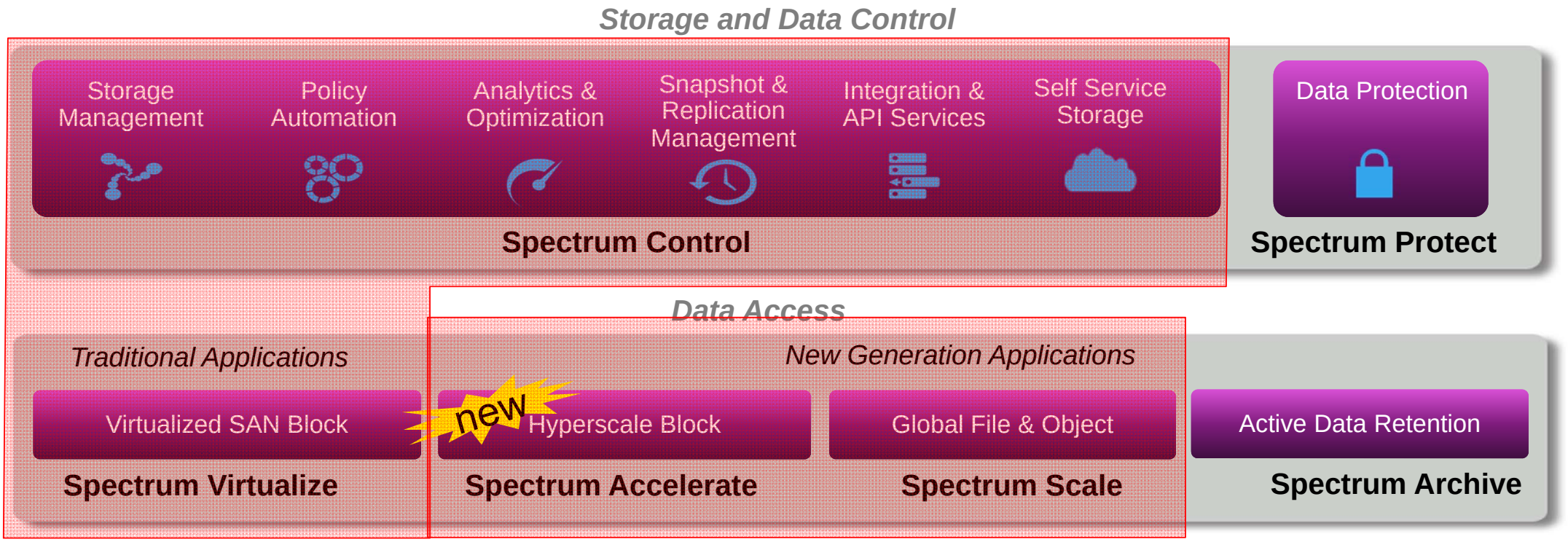
IBM Spectrum Storage Solutions



Flexibility to use IBM and non-IBM Servers & Storage or Cloud Services

IBM Storwize, XIV, DS8000, FlashSystem and Tape Systems

Non-IBM storage, including commodity servers and media

SOFTLAYER an IBM Company and non-IBM clouds

IBM's Software Defined Storage Strategy

IBM Spectrum Storage Solutions

Storage and Data Control

Storage Management | Policy Automation | Analytics & Optimization | Snapshot & Replication Management | Integration & API Services | Self Service Storage

Spectrum Control

Data Protection

Spectrum Protect

Data Access

Traditional Applications

Virtualized SAN Block

Spectrum Virtualize

New Generation Applications

new Hyperscale Block

Spectrum Accelerate

Global File & Object

Spectrum Scale

Active Data Retention

Spectrum Archive

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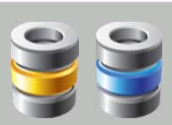


SOFTLAYER an IBM Company and non-IBM clouds

IBM Spectrum Control

IBM Storage Integration Server

- Integration in Virtualization and Cloud (VASA, vCenter Operations Manager (vCOps), …
- Enables centralized management of IBM storage:
- DS8000, SVC, Storwize, XIV

Simplicity matters!

- **Free**
- **Simple provisioning**

Tivoli Storage Productivity Center

- Storage Resource Management: Asset, Capacity Performance, Alerting, Reporting
- Replication Management (TPC-R)
- IBM and non-IBM Devices

Management matters!

- **Per TiB or per Enclosure**
- **File Share provisioning**
- **Cognos Reporting**

SmartCloud Virtual Storage Center

- SVC/Storwize Optimization & Provisioning
- SVC: Basis, Metro Mirror, Global Mirror and Flash Copy
- FlashCopy Manager

Automation matters!

- **Per TiB or per Enclosure**
- **File and Block provisioning**
- **Application Aware (FCM)**

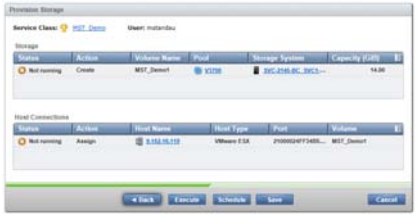
Provisioning Automation

Service Classes
Filter Attributes

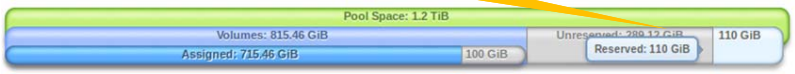
Request

Analytics Engine

Suggestion



Capacity is shown and calculated as reserved



Execute Schedule Save

Pending

Review/Approve

Execute Schedule

Service Classes
Configuration Attributes

Create/Map/Zone

Later in the lifecycle:Optimization

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SOFTLAYER an IBM Company and non-IBM clouds

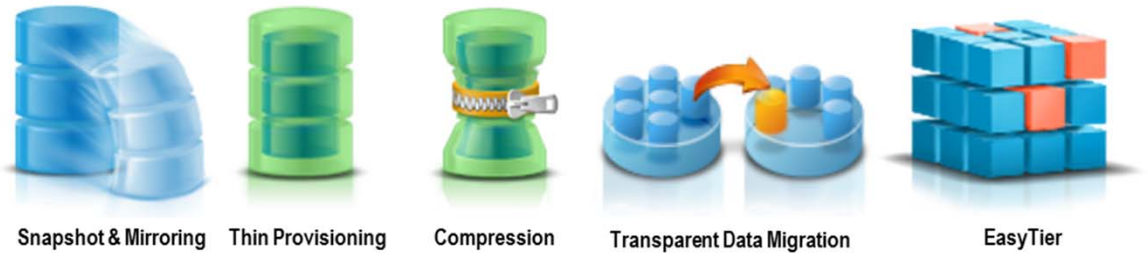
Transform the Economics of Traditional SANs

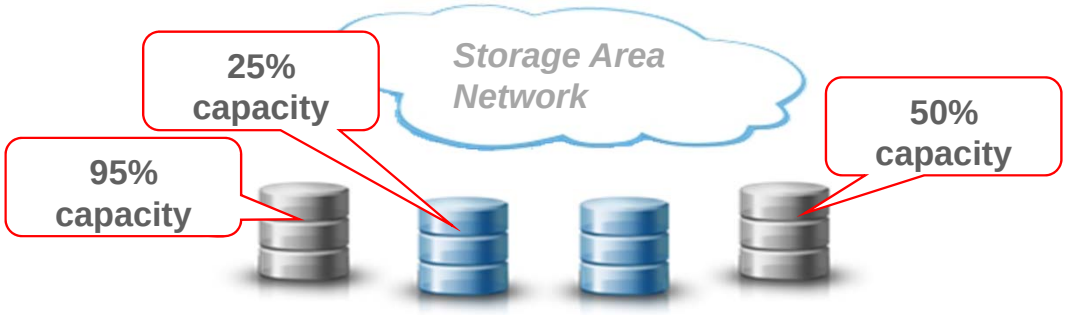
Traditional SAN

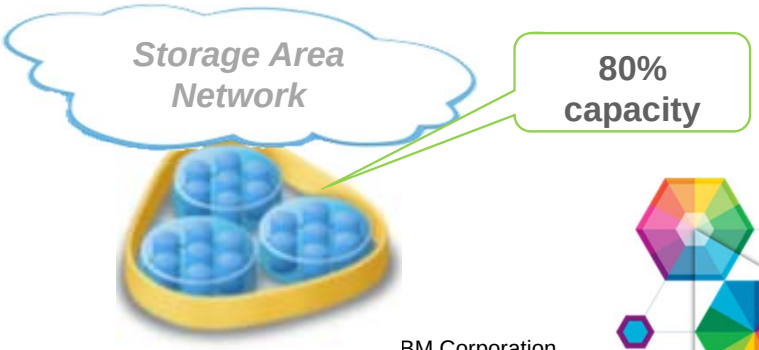
- Capacity is isolated in SAN islands
- Multiple hardware-centric management points
- Potentially poor capacity utilization
- Capacity is purchased for and owned by individual applications

Software-defined SAN

- Single management point for combined pools of capacity
- Common services across all hardware vendors for improved efficiency
- Quickly exploit new physical infrastructure alternatives – higher performance Flash and lower cost, more modular SAN disks







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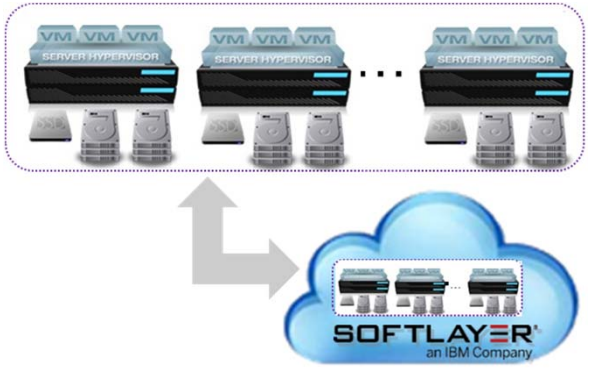
SOFTLAYER an IBM Company and non-IBM clouds

Introducing… IBM Spectrum Accelerate

- A new product that will provide for hyperscale structured data required by new application environments which are increasingly deployed in clouds.
- This new SDS pillar is A highly agile SDS solution for new & traditional workloads based on the software delivered in the proven IBM XIV Storage System
- It features the IBM XIV DNA: the only storage architecture proven to guarantee consistent high-end performance with zero tuning



Based on proven grid-scale technology from XIV System deployed in 100,000+ servers

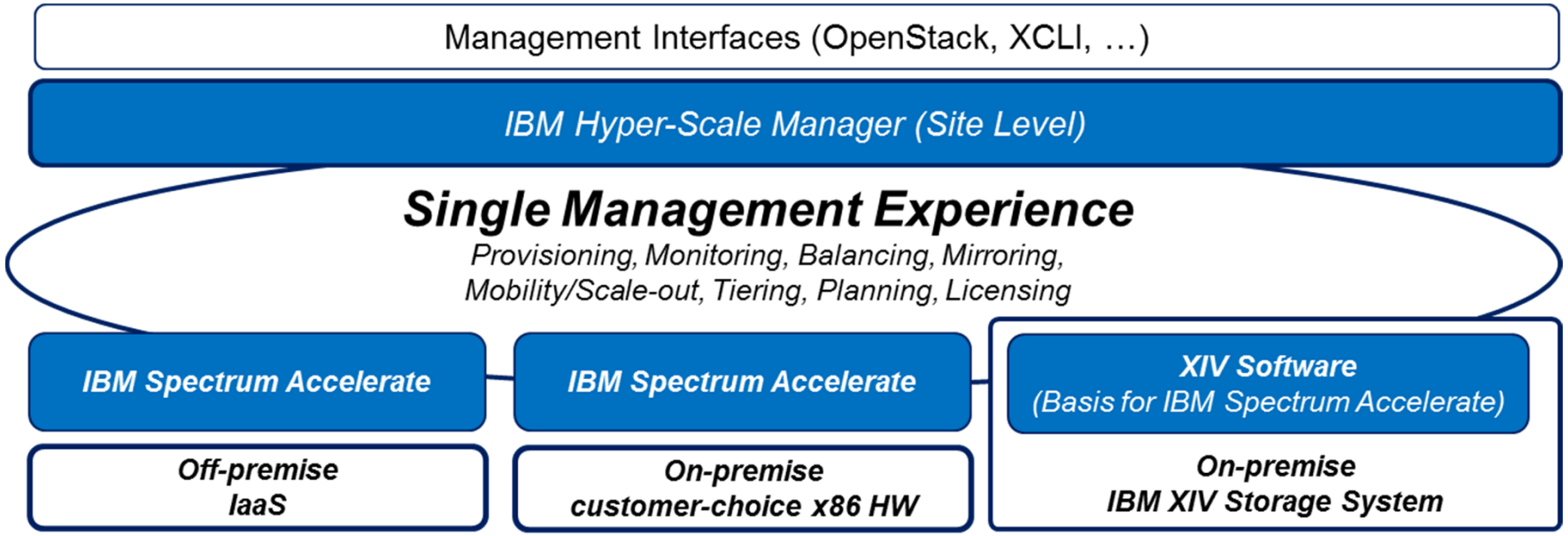
- Easy to use, with proven architecture and features
- Easy to acquire, license and deploy
- Low TCO

July 25, 2014: from the Storage Buddhist blog: "Interestingly, IBM does not seem to market XIV as SDS, even though it is clearly a software solution running on commodity hardware that has been 'applianced' so as to maintain reliability and supportability." THE DAY HAS COME ;-)

Agility, Flexibility and Choice

Opens up many platform options…

Same technology
Enterprise-level feature set
Floating license
Seamless integration
Unified management



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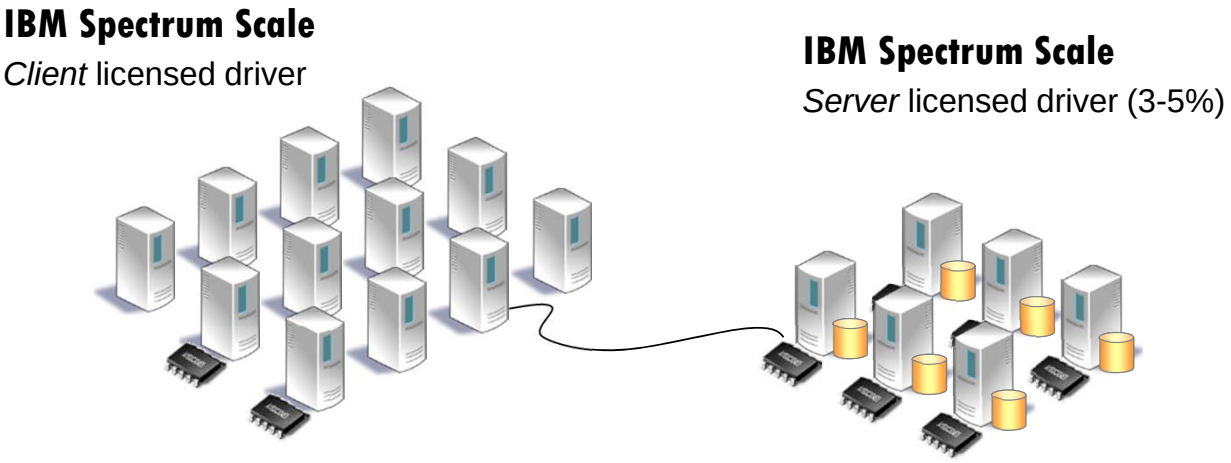
SOFTLAYER an IBM Company and non-IBM clouds

Spectrum Scale – global shared data access



Driver transforming local HDDs, Flash PCI cards and RAM cache into a distributed storage continuum, with global consistency. Based on IBM *General Parallel File System* GPFS technology.

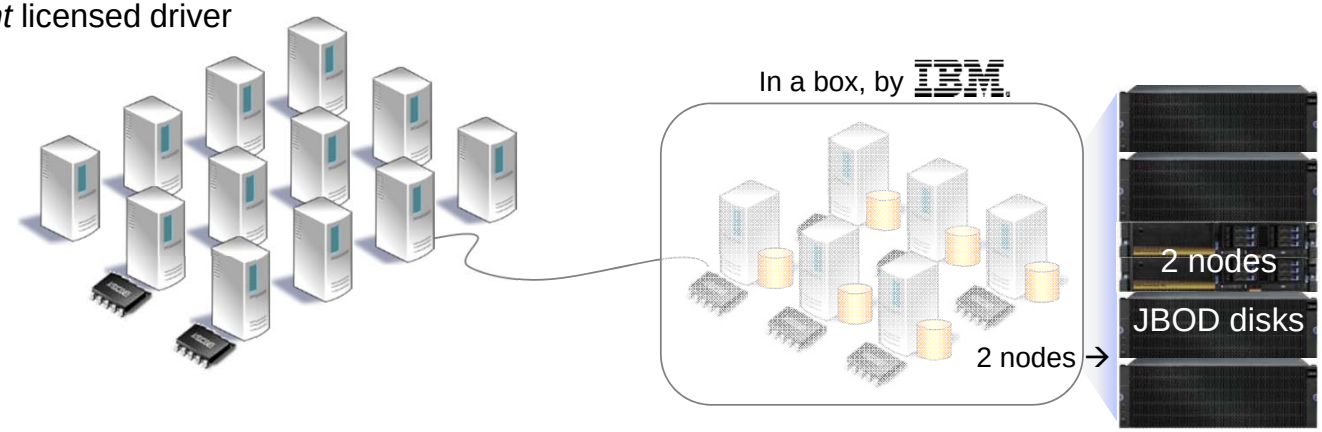
In contrast to hyperconverged appliances, experience with GPFS clusters shows that only 3-5% of all clustered servers should have local disks. This yields a good balance of access density versus metadata traffic.

Sustains data creation rates like "**2000 files/sec**" or "**30 GB/sec**" and above.

IBM Elastic Storage Server = "Spectrum Scale-in-box"

IBM Spectrum Scale®

Client licensed driver

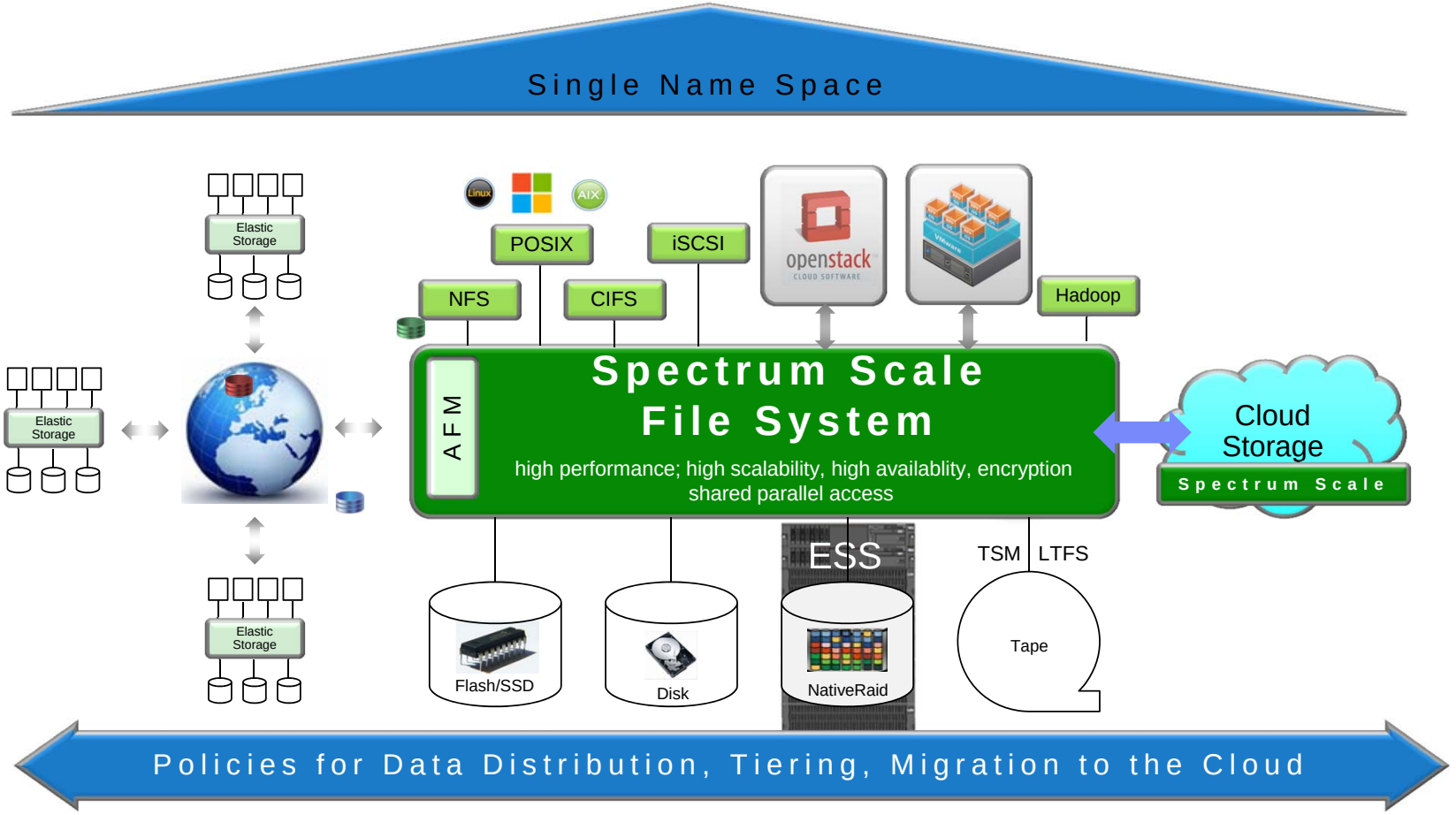


CRN Award 2013
Best Storage Innovation

Introducing high speed n+2 or n+3 erasure code data protection for JBOD, defined by policies. "Self-healing".

CRN award "best storage innovation" for fastest rebuild and
least rebuild impact (triple 4TB disk failure = 4 min 20s impact)

Spectrum Scale Overview



IBM Spectrum Scale Use Cases...

Sync & Share

IBM Elastic Storage and ownCloud

"….highly scalable on-premises alternative to cloud-based apps…"

Modular – Scalable – Economical - Open

Hadoop Consolidation

Replace HDFS with IBM Elastic Storage

"….with Elastic Storage we can cut capacity requirements for your Hadoop Environment in half…and can offer much more on top"

High Performance Backup/Archive

IBM Elastic Storage as Storage Pool

"…The peak TSM/Isilon throughput was 800MB/sec while the TSM/GPFS throughput was (5,400MB/sec) – almost seven times faster. ….it clearly shows that Isilon is not the only fruit and GPFS could be a more flavoursome fruitstuff…."

File Sharing / Collaboration

Low Latency global access to data

"…IBM offers the only Software Defined Storage Solution for clients who need to intelligently access or synchronize data at multiple sites - globally…."

World-Wide Data Distribution

Hybrid Cloud

Elastic Storage with Multi Cloud Storage Toolkit

"…IBM Elastic Storage offers a unique perspective of integrating an on premise private cloud with multiple public cloud offerings seamlessly…."

SAP HANA

Elastic Storage for SAP HANA TDI

"…IBM servers and Elastic Storage formed the basis of the three highest-performing HANA systems demonstrated to date…."

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IBM FLASH

Introducing the New IBM FlashSystem Family Offerings

IBM FlashSystem V9000

- Scalable Performance: Grow capacity and performance with up to 2.2PB scaling capability
- Enduring Economics: Next generation flash media with lower cost per capacity
- Agile Integration: Fully integrated system management to simplify management and improve workforce productivity under a single name space

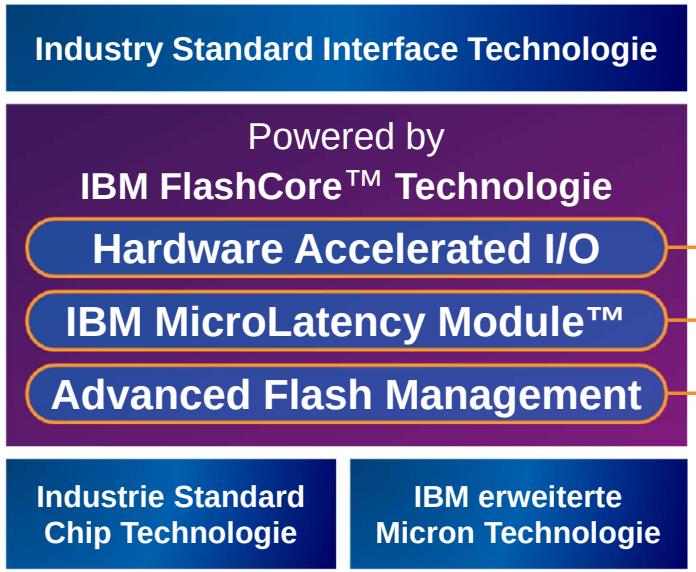
IBM FlashSystem 900

- Extreme Performance: Delivers 100 microsecond response times
- Macro Efficiency: Lowest latency offering with >40% greater capacity at a lower cost per capacity
- Enterprise Reliability: IBM enhanced Micron MLC flash technology with Flash Wear Guarantee

Powered by IBM FlashCore™ Technology

IBM FlashCore™ Technologie

the DNA of the IBM FlashSystem Familie

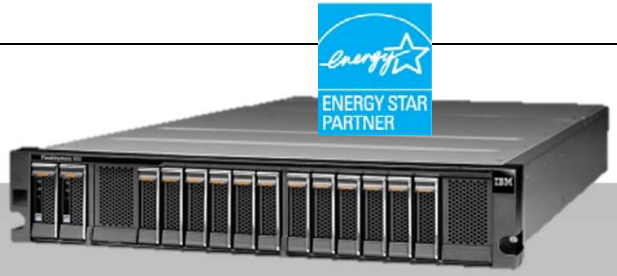


- Engineered for Flash
- Hardware RAID
- Non-blocking Crossbar Switch
- Hardware Only Data Path
- Single Box Highly Available Architecture
- Concurrent Code Load & Maintenance

- IBM Engineered
- Massively Parallel Design
- FPGAs in the Data Path
- Distributed RAM
- High Speed Interface
- Line Speed Data at Rest Encryption

- IBM Variable Stripe RAID™
- IBM Engineered ECC
- IBM Optimized Overprovisioning
- Wear Levelling
- Write Buffer & Hardware Offload
- Garbage Collection

FlashSystem 900



Introducing IBM FlashSystem 900, the next generation in our lowest latency offering

- IBM MicroLatency™ with up to 1.1 million IOPS
- 40% greater capacity at a 10% lower cost per capacity
- IBM FlashCore™ technology, our secret sauce

Technical collaboration with Micron Technology, our flash chip supplier

- IBM enhanced flash technology
- MLC NAND flash offering with Flash Wear Guarantee

VAAI UNMAP and VASA support with IBMSIS for improved cloud storage performance and efficiency

Performance at-a-glance

Minimum latency	
Write	90 µs
Read	155 µs
Maximum IOPS 4 KB	
Read (100%, random)	1,100,00
Read/write (70%/30%, random)	800,000
Write (100%, random)	600,000
Maximum bandwidth 256 KB	
Read (100%, sequential)	10 GB/s
Write (100%, sequential)	4.5 GB/s

IBM MicroLatency module type	1.2 TB					2.9 TB				5.7 TB			
Modules quantity	4	6	8	10	12	6	8	10	12	6	8	10	12
RAID 5 capacity (TB)	2.4	4.8	7.2	9.6	12	11.6	17.4	23.2	29.0	22.8	34.2	45.6	57.0
Raw Capacity (TB)	7.1	10.7	14.2	17.8	21.4	26.3	35.1	43.9	52.7	52.7	70.3	87.9	105.5

FlashSystem V9000

Powered by FlashCore™ Technology

IBM introduces a fully integrated, fully managed, full function all-flash storage system

Scalable Performance | **Enduring Economics** | **Agile Integration**

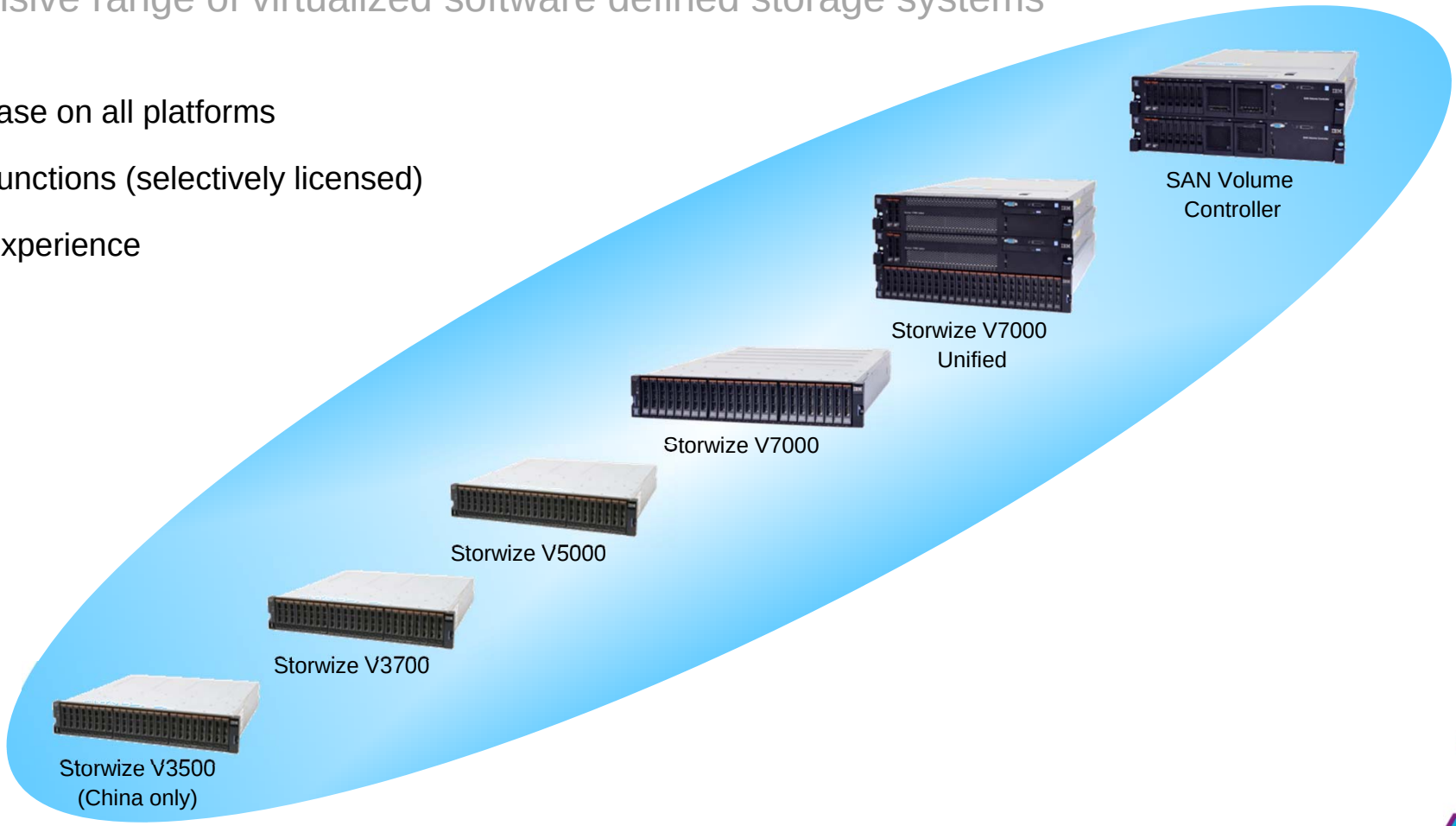
- Scalable all-flash architecture with full set of advanced data features
- Performs at up to 2.5M IOPS with IBM MicroLatency, scalable to 19.2 GB/s
- Scales to 456 TB usable and up to 2.28 PB effective capacity in only 34U
- Up to 57 TB usable and up to 285 TB effective capacity in only 6U
- New licensing structure to simplify ordering and planning for External Data Virtualization, Flash Copy, Metro Mirror, and Real-time Compression

IBM Storwize

The Storwize Family

Comprehensive range of virtualized software defined storage systems

- One code base on all platforms
- One set of functions (selectively licensed)
- One client experience



IBM DS8870

But despite…

...the future being shaped around the 3rd platform with rapid shifts to software- and services- defined models....

- Still significant demand for traditional monolithic High End Storage Systems
- …Increasingly focused around “connectivity to niche and proprietary systems”
- Expected movement in this market by zNext Mainframe announcement

*---“The business demand for high-end storage systems is **driven by the need to run high-availability applications and connectivity to niche and proprietary systems**. Buyers of these systems are risk-averse, and need robust software ecosystems, high levels of functionality and feature-rich data replication options, such as three-site topologies.”*

*---”For the foreseeable future, traditional, high-end storage solutions **will carry a price premium** relative to midrange scale-up and scale-out systems”*

Source: Gartner, IT Market Clock for Storage, 2014

IBM DS8870…still the core of our Storage Business

Sell DS8000 Unique Value Proposition

- **4x better** flash performance in **50% less** space with High Performance Flash Enclosure
- Deep synergy with z Systems, **18 of the top 20** world largest banks use DS8000 for Core Banking
- Industry leading **24 by 7 availability** and disaster recovery solutions with 3 and 4 site
- **Self-tuning** IBM Easy Tier®, automated quality-of-service management
- Advanced security with **full disk encryption**

Sell TS7700 Unique Value Proposition

- **63 of the top 100** z Systems clients have IBM tape
- Automatic, transparent integration lead to **no operator intervention** required and **no downtime**

Delivering data with the performance and availability optimized for IBM zNext

"…The latest high end EMC storage the VMAX3 is currently not supporting FICON channels and EMC has not announced any firm statement of direction of when it will deliver FICON capability. Mainframe users committed to EMC may purchase the outdated VMAX series 40K which delivers much lower performance than the VSPG1000 or the DS8870. Delivering Tier 1 products without FICON demonstrates EMC's shortage of developers and the lack of commitment to mainframe storage…."

Josh Krischer & Associates
Data Center Consulting

Thank You