

Bienvenidos



XIV Almacenamiento Dinámico

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Historia del almacenamiento



- * RAID?
- * Tiers?
- * Cache?
- * SSD?
- * HDD?
- * Seek time?
- * RPM?

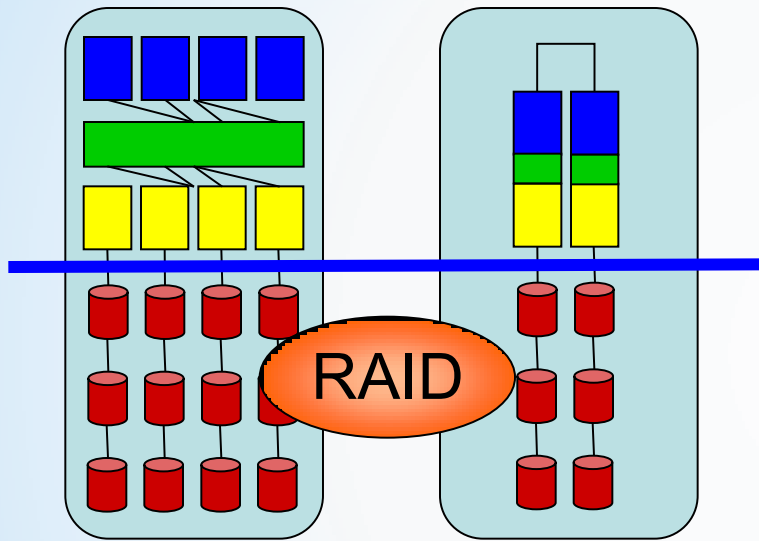
Almacenamiento



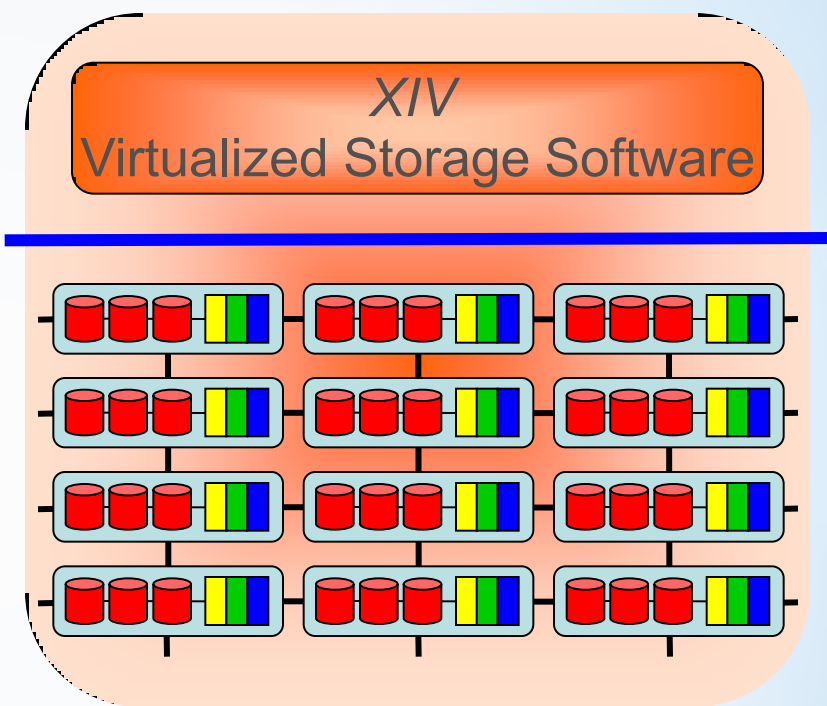
¿Por qué XIV es diferente?



How is XIV different?

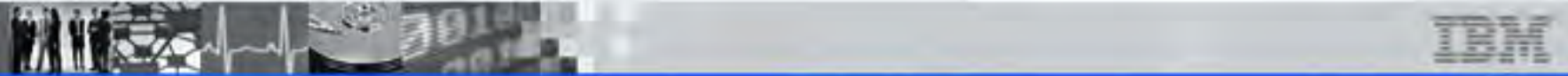


vs.



- * Commodity disks only
- * Custom controller / cache hardware
 - * Fixed number of controllers
 - * Expensive
- * Fixed interconnect backplane
- * Hardware RAID

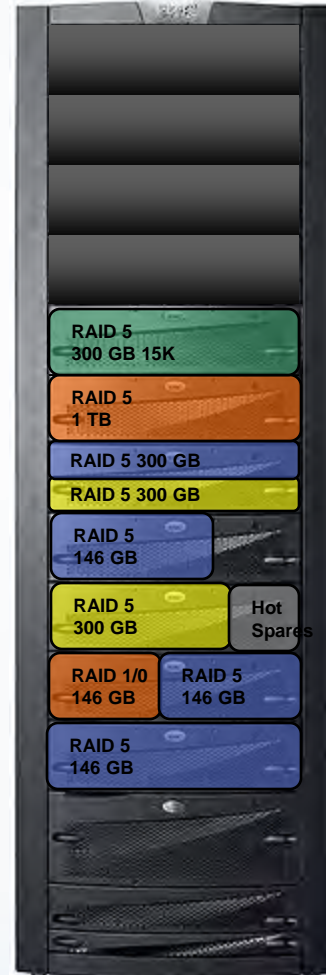
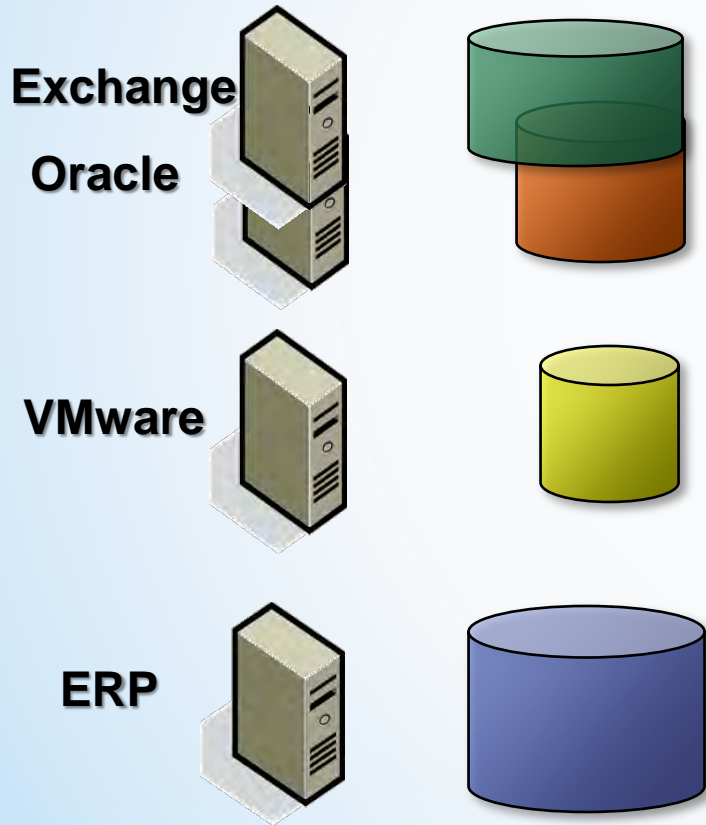
- * Full commodity hardware
- * Extensible grid of servers
 - * Ethernet or Infiniband interconnect
- * Data-based mirroring
- * Fully virtualized storage functionality



XIV arquitectura



XIV Architecture Overview: Traditional Storage Distribution

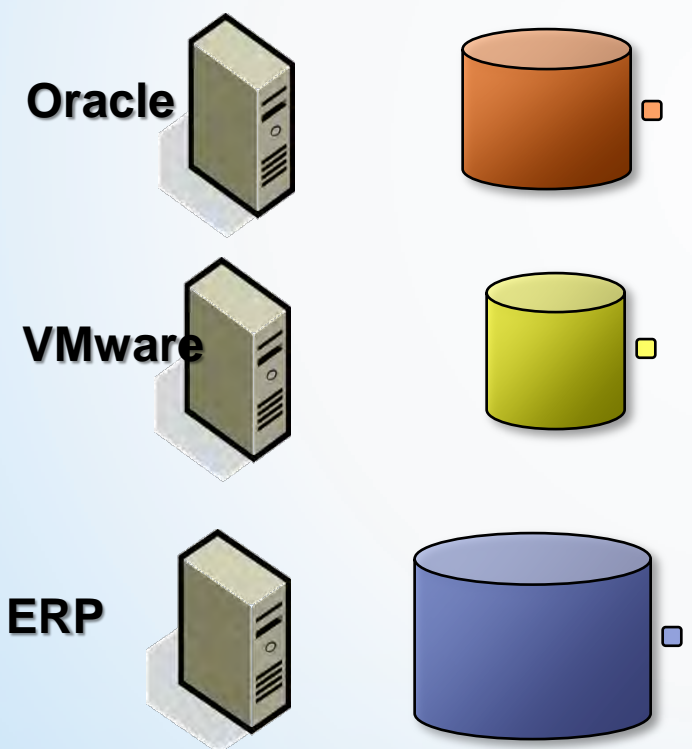


- Scalability is limited and not linear
- Expensive and complex but performance issues required analysis, design and tuning performance, a redesign/layout is required
- Lots of work to keep and maintain this array

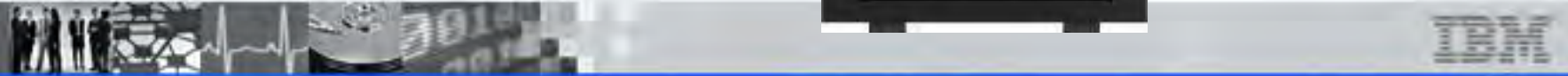
XIV Architecture Overview:

XIV Storage Distribution

Ground-breaking
Architecture

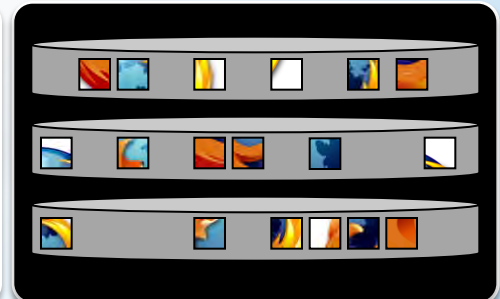
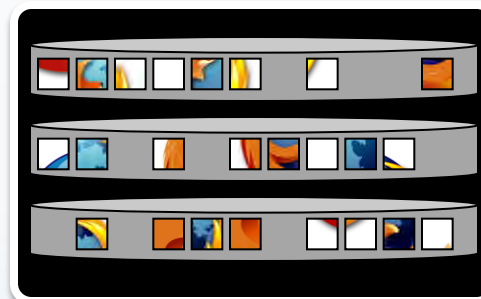
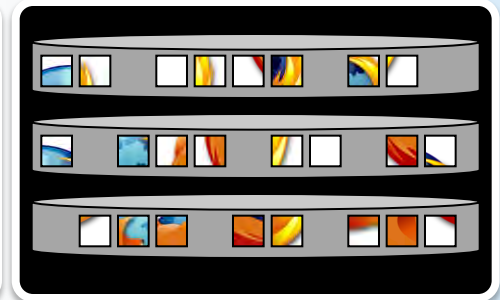
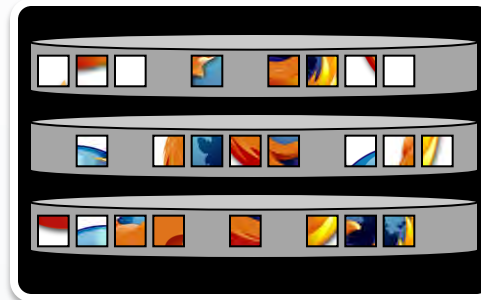


- Data auto-spread across all drives
- Even disk utilization
- NO manual intervention
- No tuning
- No hotspots



XIV Data Redistribution

- When capacity is added (*CPU cache and connectivity*)
 - Equilibrium is maintained
 - Microcode automatically rebalances the grid
 - All attached hosts immediately take advantage of added components



[hardware upgrade]

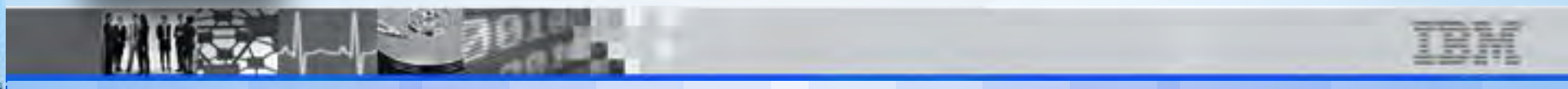
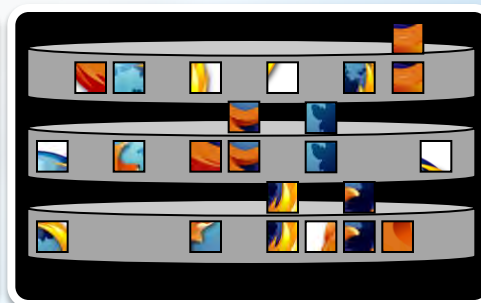
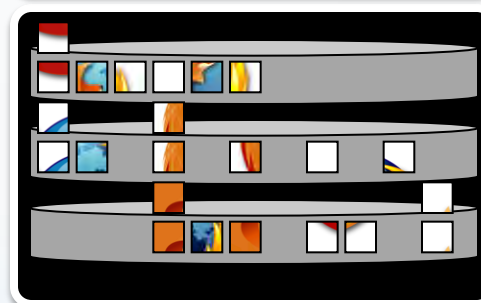
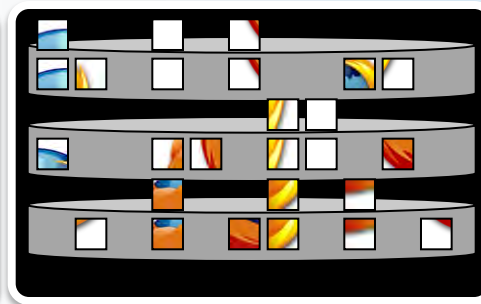
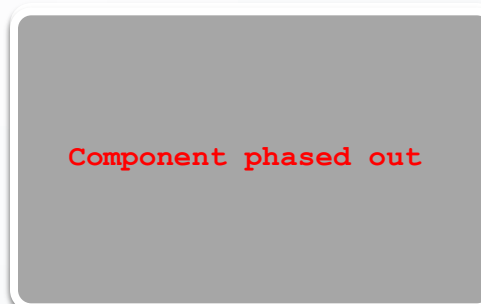
XIV Data Redistribution

- Intelligently reacts to HW faults
 - Equilibrium is always kept
 - Eliminates parity limitations
 - Superior data integrity

Single Disk Idle Rebuild (idle)			
100% capacity used	Gen2 1TB	Gen3 2TB	Gen3 3TB
completion time (min)	30	48	76

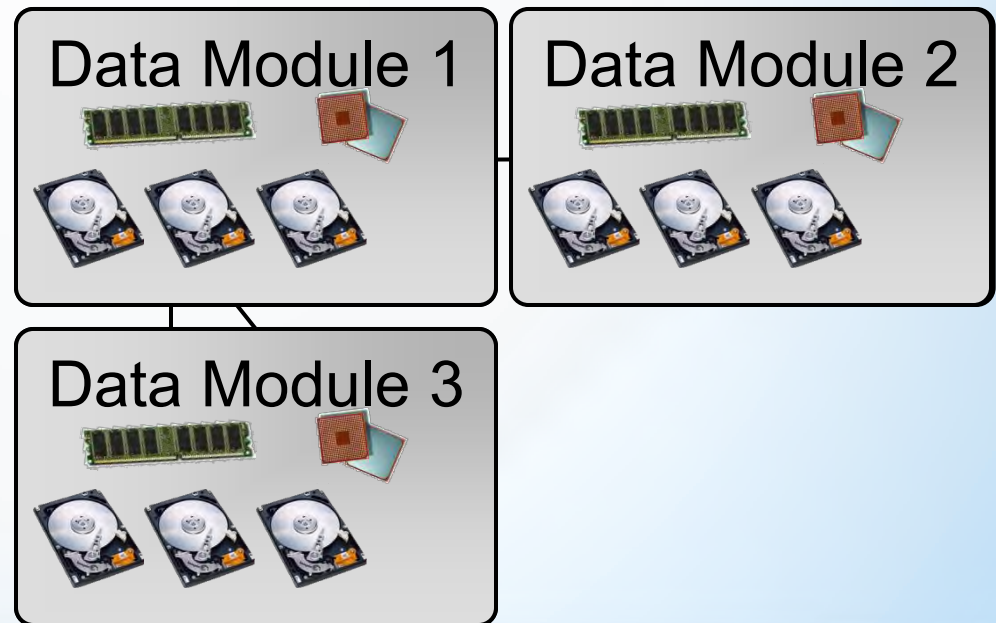
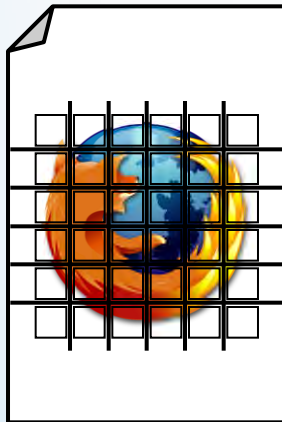


Auto rebalancing during hardware failure



XIV's Distribution Algorithm on System Changes

- * Data distribution only changes when the system changes
 - * Equilibrium is kept when new hardware is added
 - * Equilibrium is kept when old hardware is removed
 - * Equilibrium is kept after a hardware failure



XIV Gen 3

Components Review

Cache node

Basic building block of XIV, one per Module. Responsible for storing a portion of the overall data set. Manages disk drives and handles all storage features - snapshots, caching, pre-fetching, etc.

- 1 six core CPU
- High efficiency Power Supplies
- 24GB/**48GB** DRAM cache
- 400GB SSD read cache (optional)
- 12 1TB, 2TB, 3TB, **4TB** SAS disks
- PCIe 2.0 bus

Interface node -

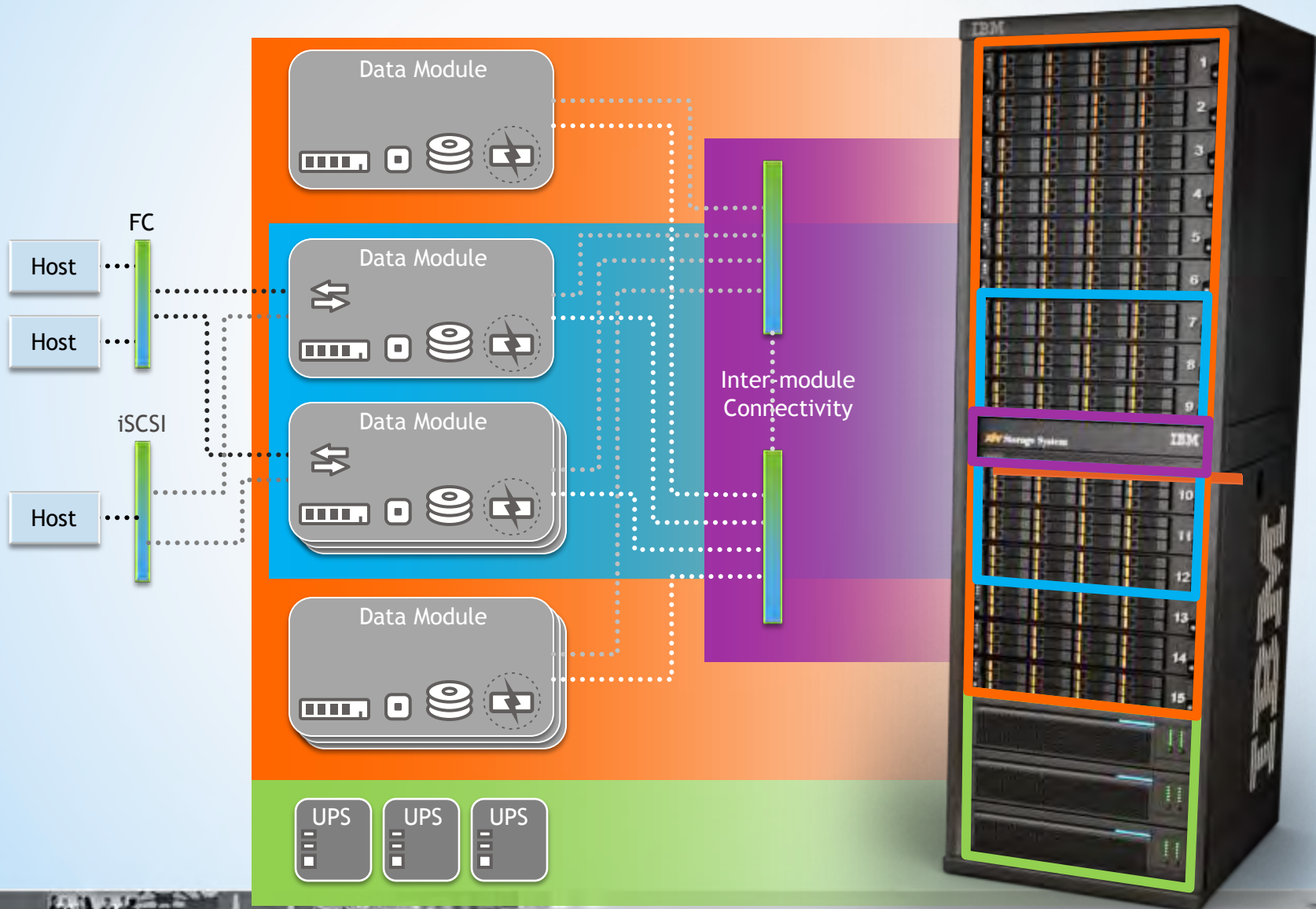
Runs on subset of Modules (4-9), routes incoming I/Os from hosts to cache nodes



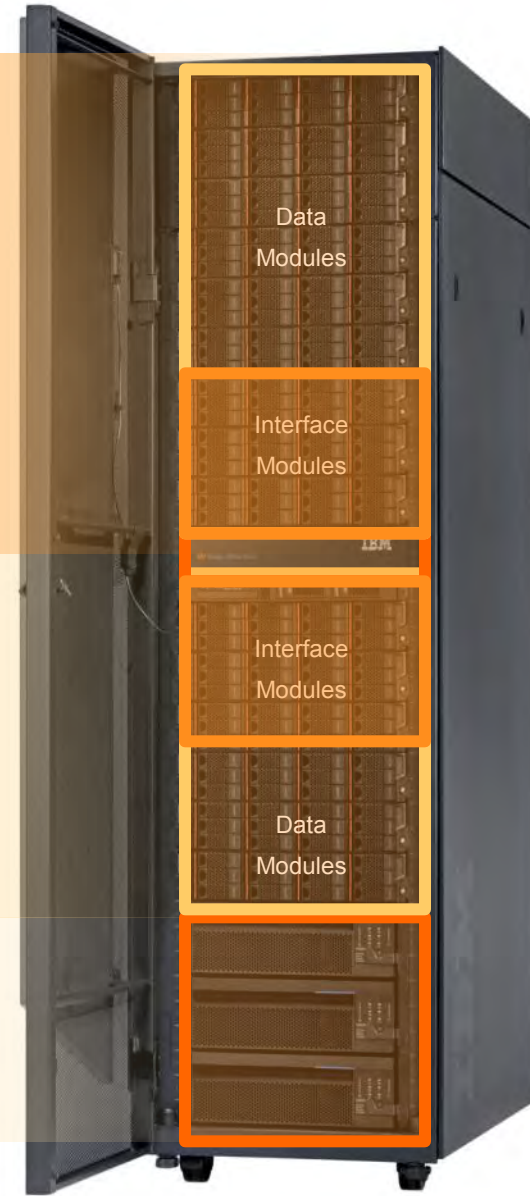
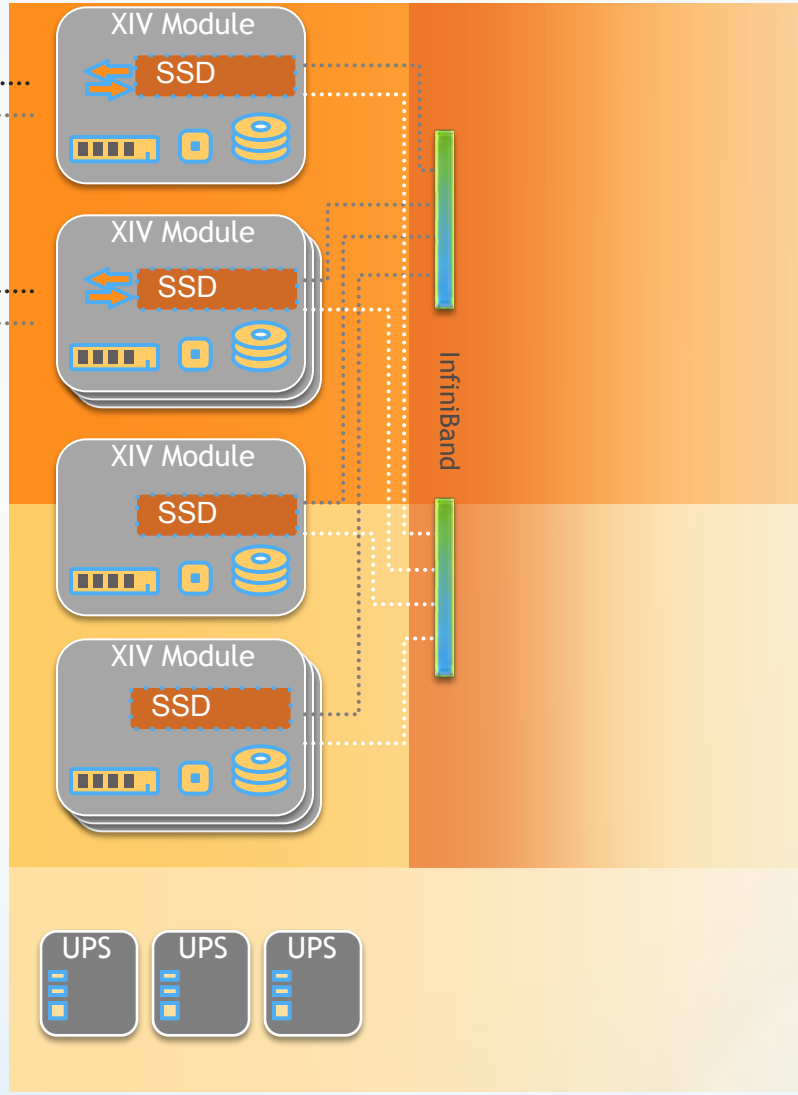
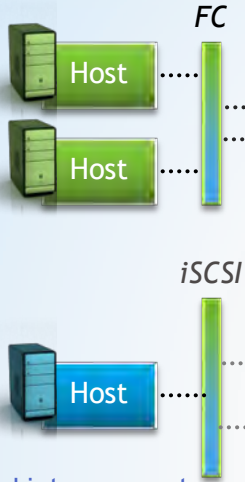
Gen3 Data Module



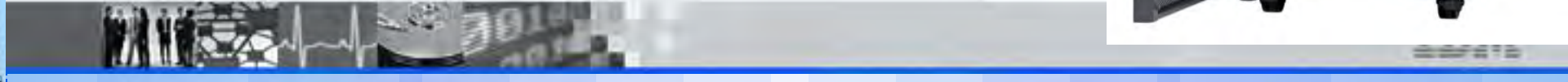
XIV System Components



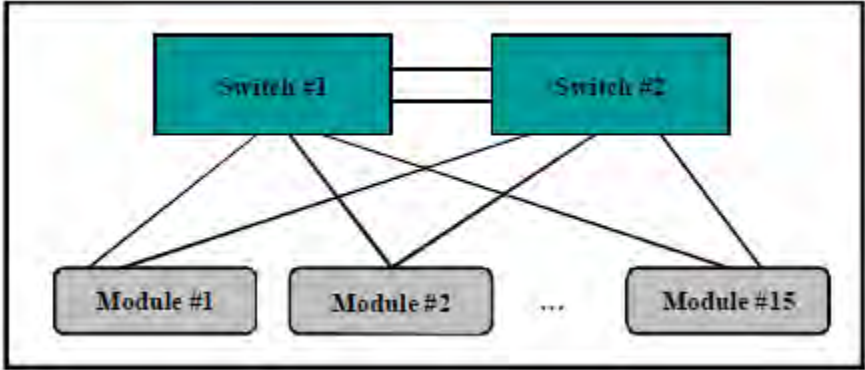
XIV Gen3



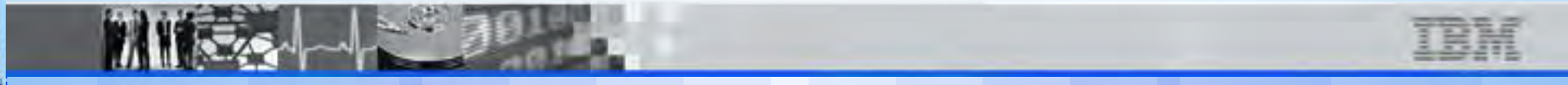
- InfiniBand interconnect
- Updated modules
 - 1 six core CPU
 - High efficiency Power Supplies
 - 24GB/48GB DRAM cache
 - 400GB SSD read cache (optional)
 - 12 1TB, 2TB, 3TB, 4TB SAS disks
 - PCIe 2.0 bus
- Full Rack – 81TB / 161TB / 243TB / 325TB
 - 15 modules
 - 180 SAS disks
 - 360GB DRAM cache
 - 24 8Gb FC ports
 - 6TB SSD read cache (optional)
 - 12x 10GbE / 22x 1GbE iSCSI ports
- Partial Rack – 6,9-14 Modules



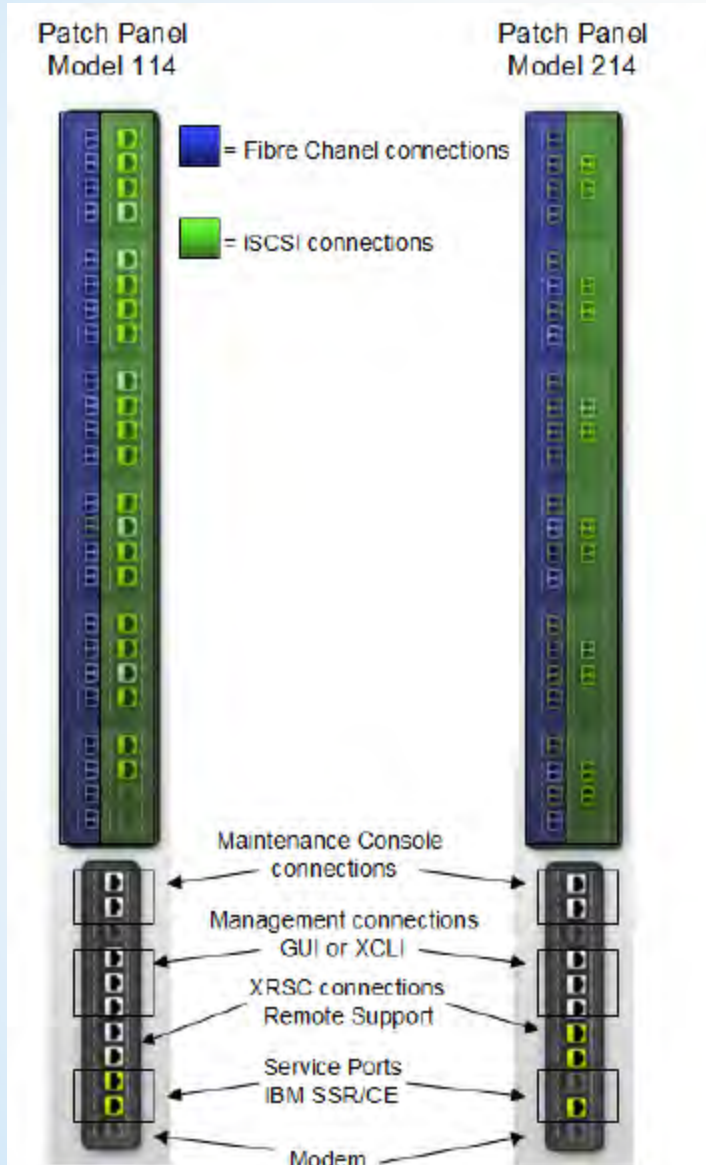
XIV InfiniBand



- * Each InfiniBand switch contains 36 ports that have 40 Gbps full bidirectional bandwidth per
- * port. Port-to-port latency is less than 100 nano seconds. Each switch has 2.88 Tbps switching
- * throughput. The switches are powered by redundant power supplies and fan modules to
- * eliminate any single point of failure. Additionally, each switch has several RJ-45 management
- * ports that are used by the XIV Storage System.



XIV FC iSCSI iSCSI 10Gb



- * 24 8Gb FC ports
- * 12x 10GbE / 22x 1GbE iSCSI ports

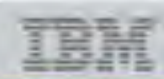
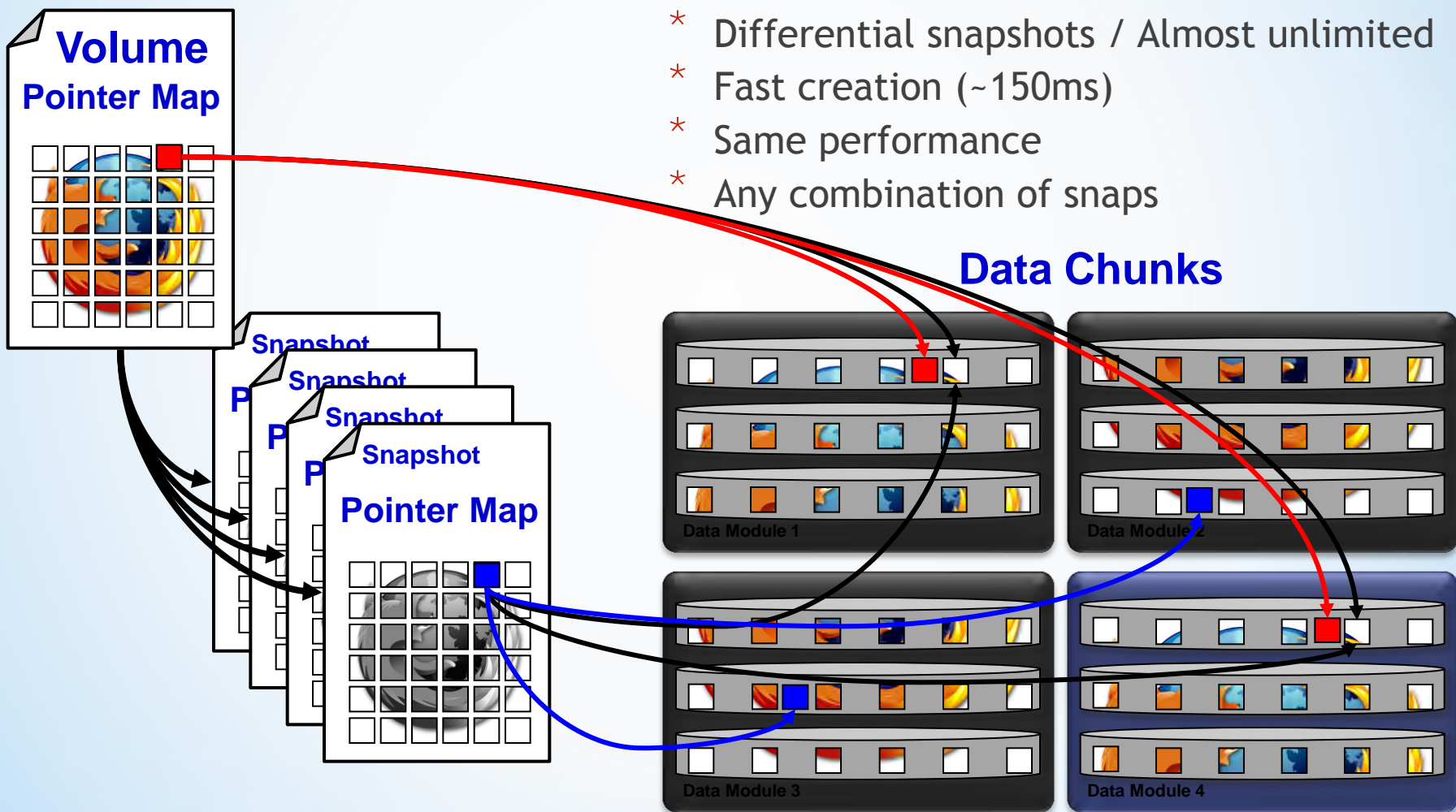


Snapshots redirect-on-write



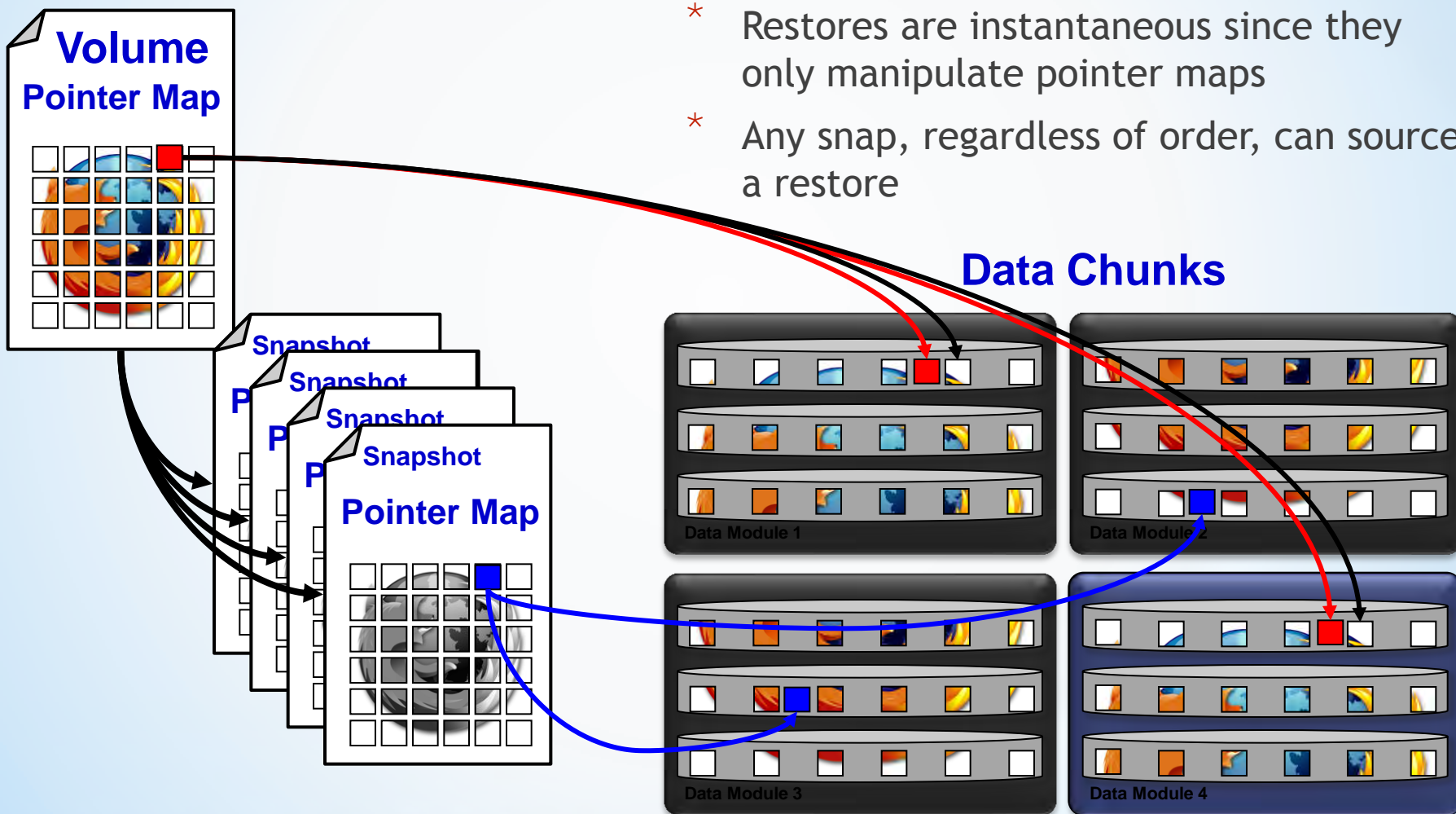
XIV Snapshots: Powerful and Efficient Local Replication

- * Differential snapshots / Almost unlimited
- * Fast creation (~150ms)
- * Same performance
- * Any combination of snaps



XIV Snapshots: Powerful and Efficient Local Replication

- * Restores are instantaneous since they only manipulate pointer maps
- * Any snap, regardless of order, can source a restore



Todas las funcionalidades incluidas

Intuitive management interface

Thin provisioning

Migration

Snapshot protection

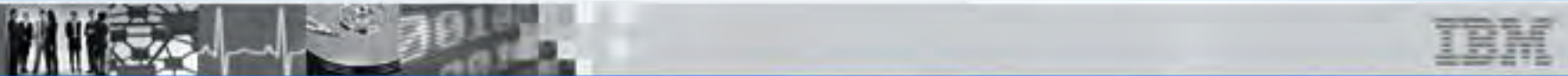
Replication

Quality of Service

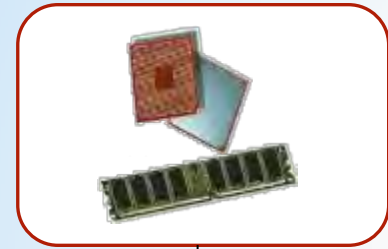
Performance Monitoring and Alerting



SSD's XIV



Just another Tier



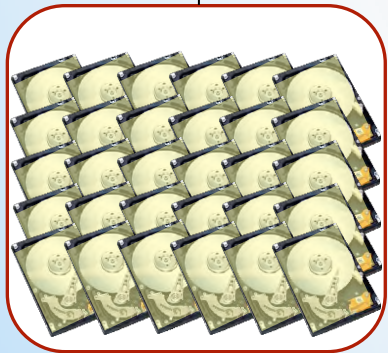
Memory



SSD



FC

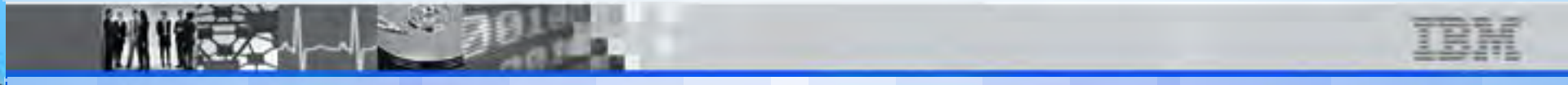


SATA

Considerations

- Multiple independent layers
- Re-active movement
- Software required – cost? error?
- Decisions - How much of each?

Data movement
requires software
Constrained to
defined policy



XIV SSD Caching: Design Goals

Invisible

- Allow wide deployment of SSDs without increasing IT complexity
- Allow customers to focus on capacity and service management, not disk technologies

Reliable

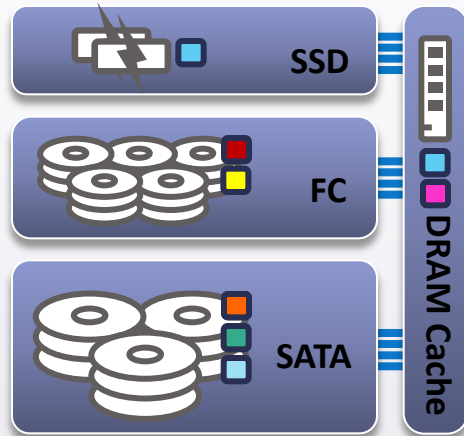
- At least 99.999% availability, beyond the reliability of today's off-the-shelf SSD technology

Affordable

- Wide SSD deployment is currently limited by cost
- System software handles SSD wear-leveling and data placement, allowing greater drive choice flexibility, and keeping prices low

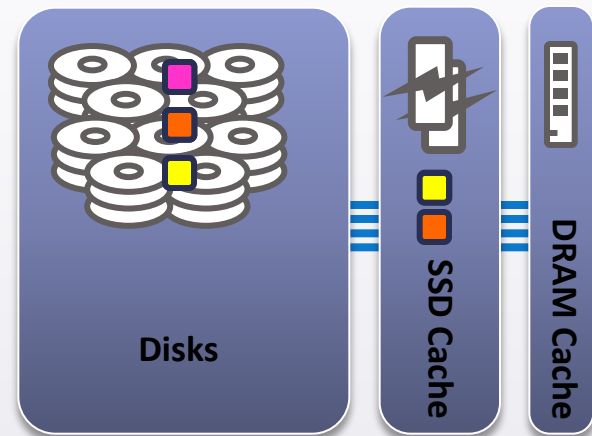
Approaches for Using SSDs in a Storage System

SSD as a Tier



- Multiple independent disk tiers provide different levels of service
- Data can be relocated between tiers
 - Manually
 - Automatically, policy driven
- A memory cache serves all tiers

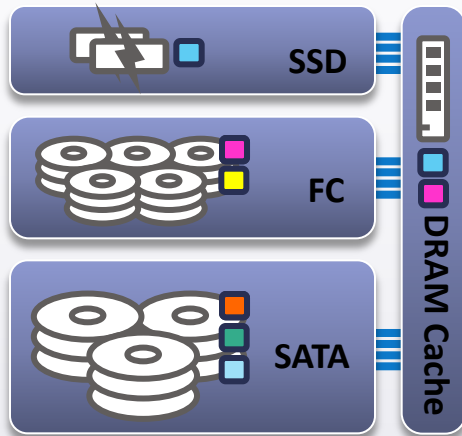
SSD as a Cache



- SSDs do not change how XIV handles data
- SSDs used as a secondary cache between the disks and the DRAM cache
- Disk access is avoided when host read resides in the SSD cache

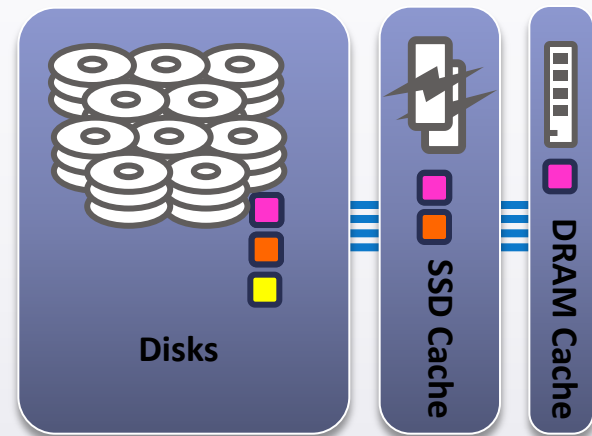
Advantages of Using SSDs as Cache

SSD as a Tier



- How much of each?
- Multiple independent layers
- Tier management software
 - Policy based - management
 - Reactive - takes a while to see benefit
 - Cost
- SSDs are RAID protected

SSD as a Cache



- Each module has SSD drive sized for optimum performance
- Data movement is inherent to the architecture and happens naturally
- No separate software to manage - no decisions
 - Benefits start immediately
 - No tuning
- Data on SSD is for read hits only - no need to protect - XIV uses the whole SSD

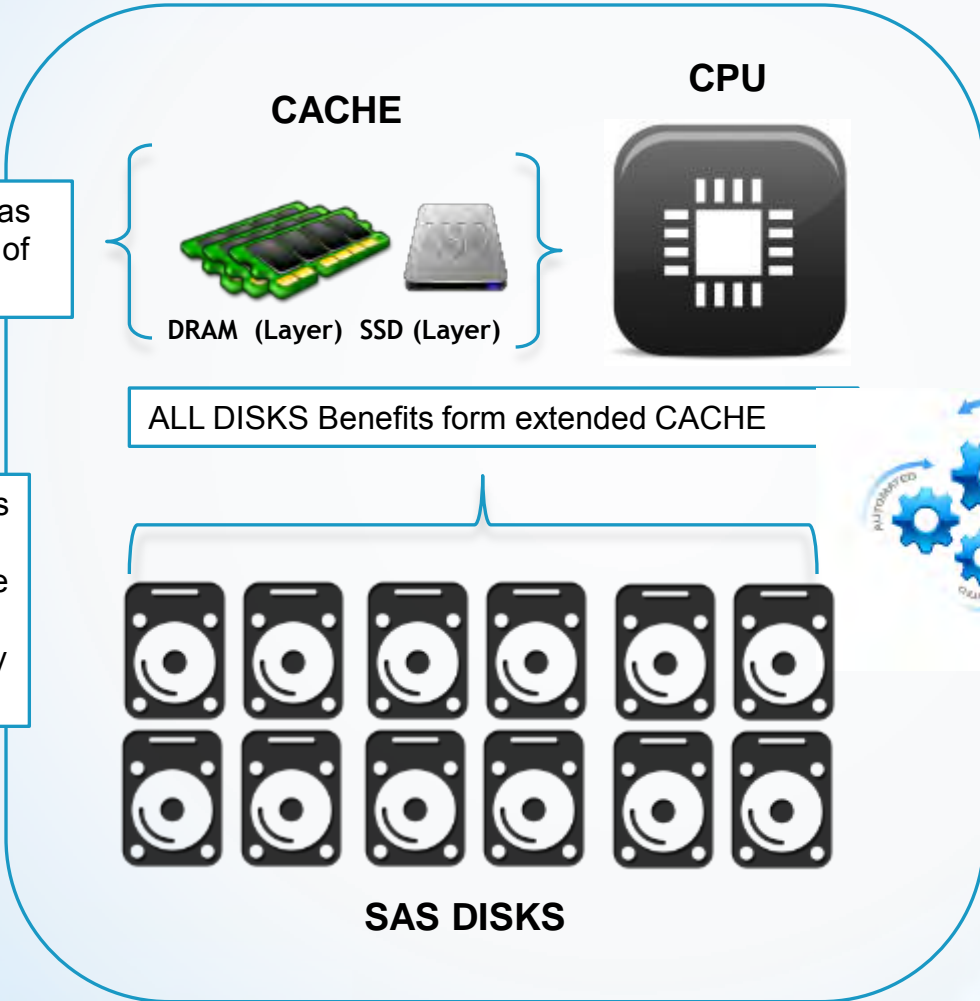
SSD Architecture

Same Concept, Different Approach

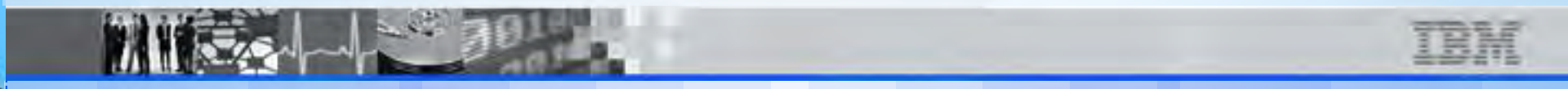
- Considerations
- Real time movement
 - **No software**
 - **No decisions**

SSD mapped as an **extension** of memory

Data movement is inherent to the architecture of the system and happens naturally

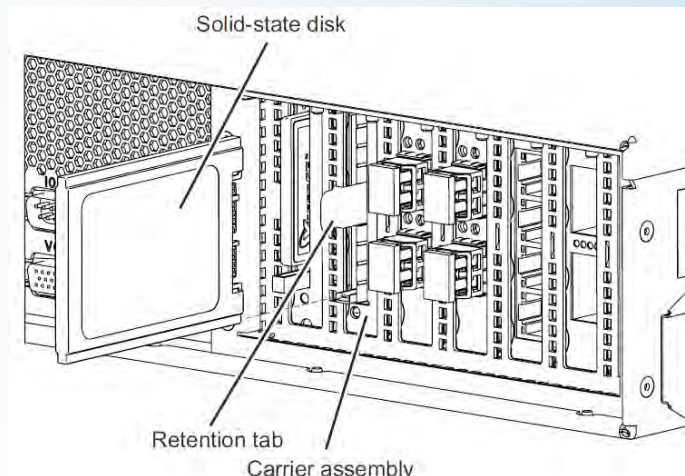


Allocates SSD slots dynamically according to the detected workload patterns



XIV SSD Solution

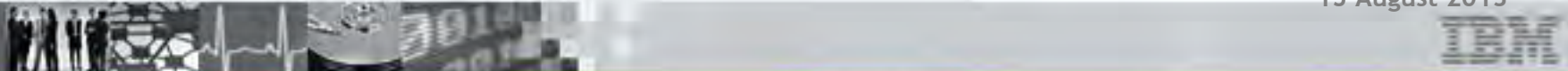
- * **High capacity SSDs used as secondary read cache**
 - * 400 GB enterprise-class SSD device added to each module
 - * 6 TB of cache per full rack
 - * Housed in PCI caddy in rear of module
 - * Scales with the system - 6 to 15 SSD drives
 - * Must be added to all modules together
- * **XIV SSD is a transparent read cache, not a separate tier.**
 - * No change to system usable capacity
 - * Zero management, zero tuning
 - * Real-time cache algorithm (not policy-based)
 - * Immediate performance improvement
- * **Available to all Gen3 systems**
 - * Priced feature code # 1155
 - * Order with SSD from factory
 - * Non-disruptive upgrade on existing XIV
- * **Note SSD size difference from Gen3 July 2011 announce**
 - 512 GB SSD - 7.5 TB for full rack



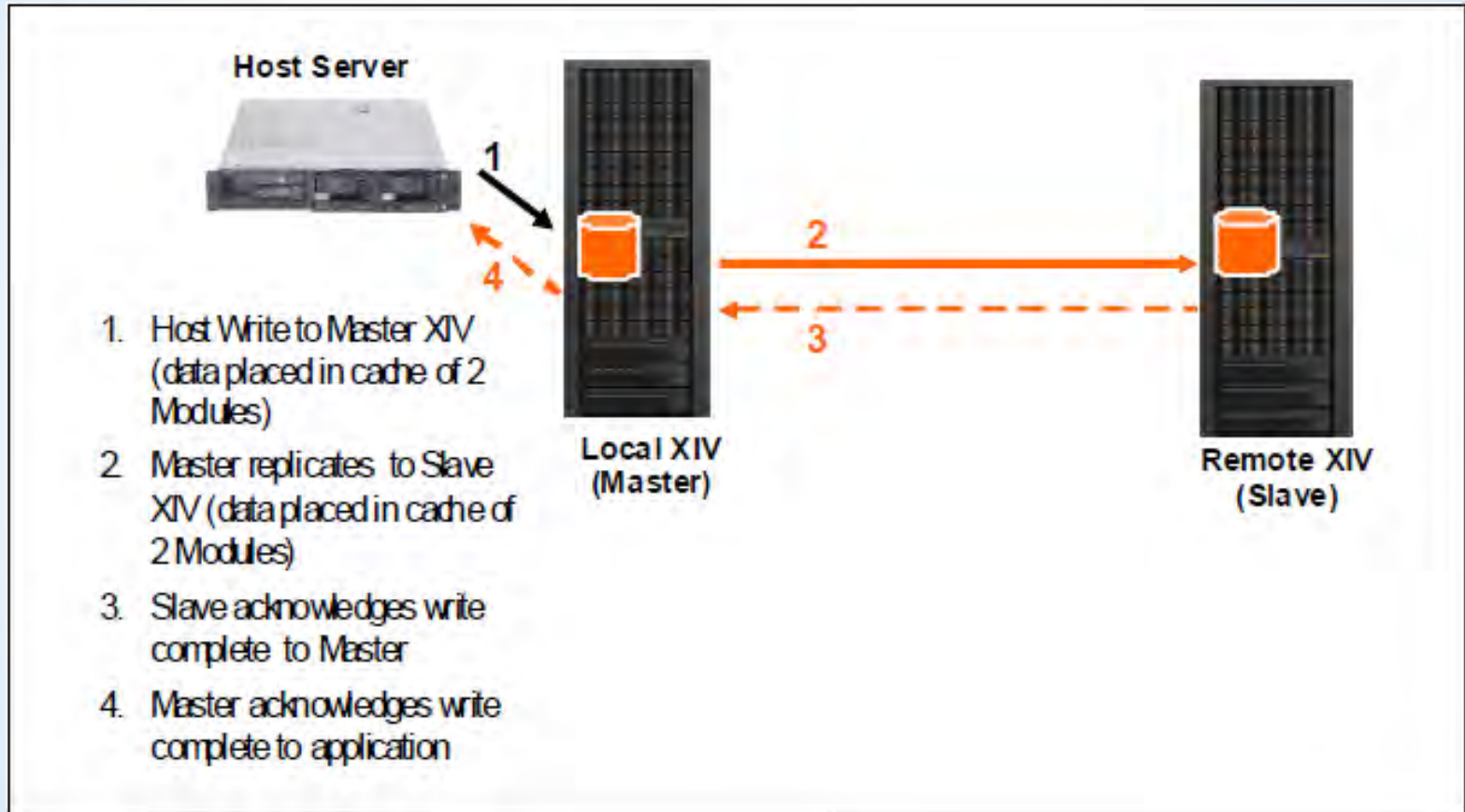
XIV Remote Mirror



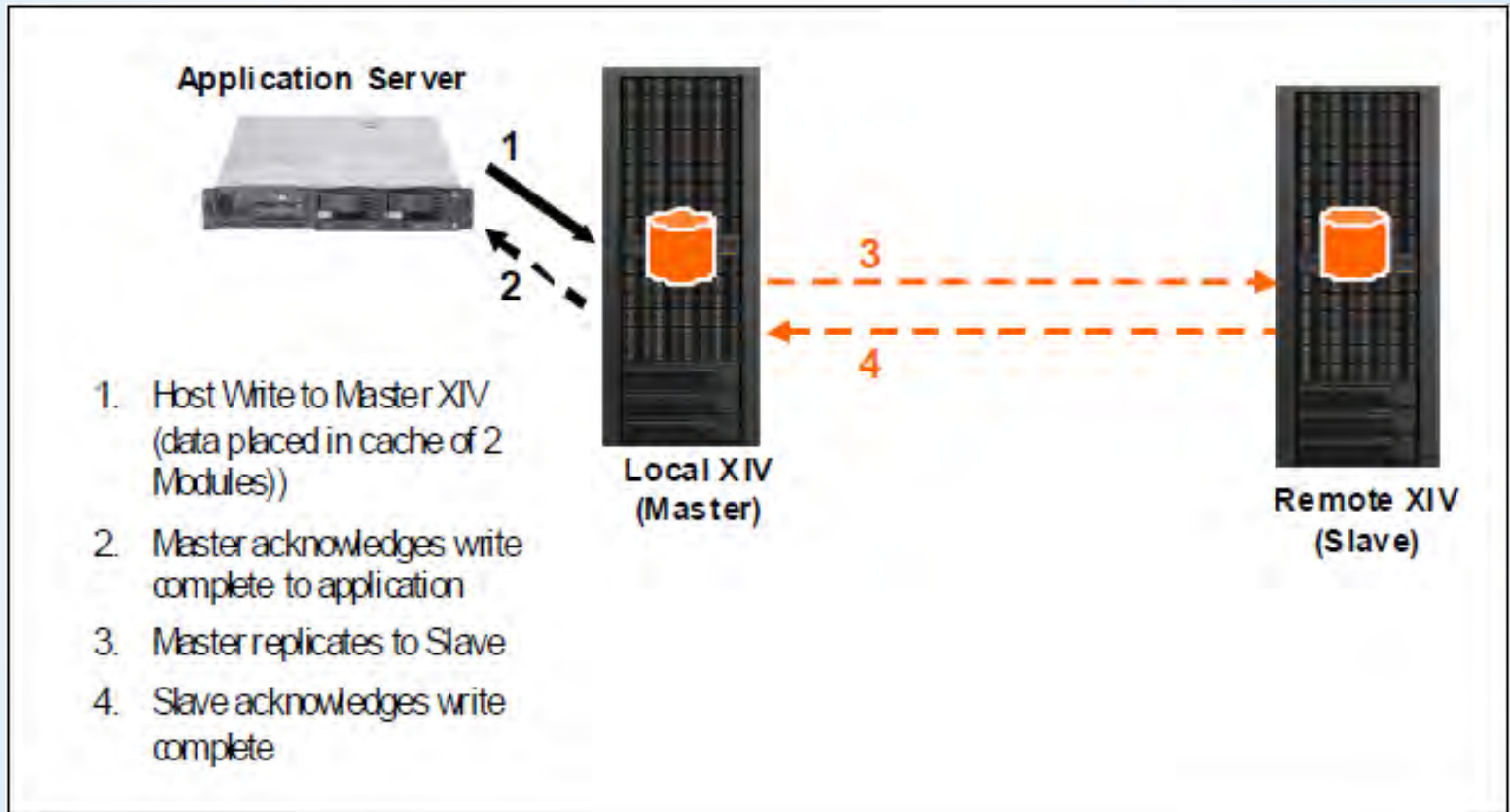
Réplica Remota- Remote Mirror



Réplica sincrónica



Réplica asincrónica



XIV HyperScale



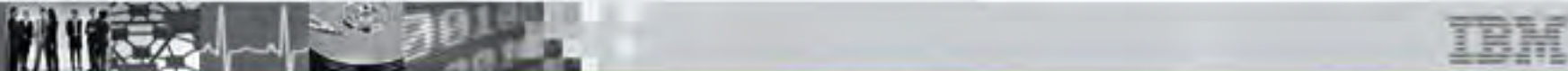
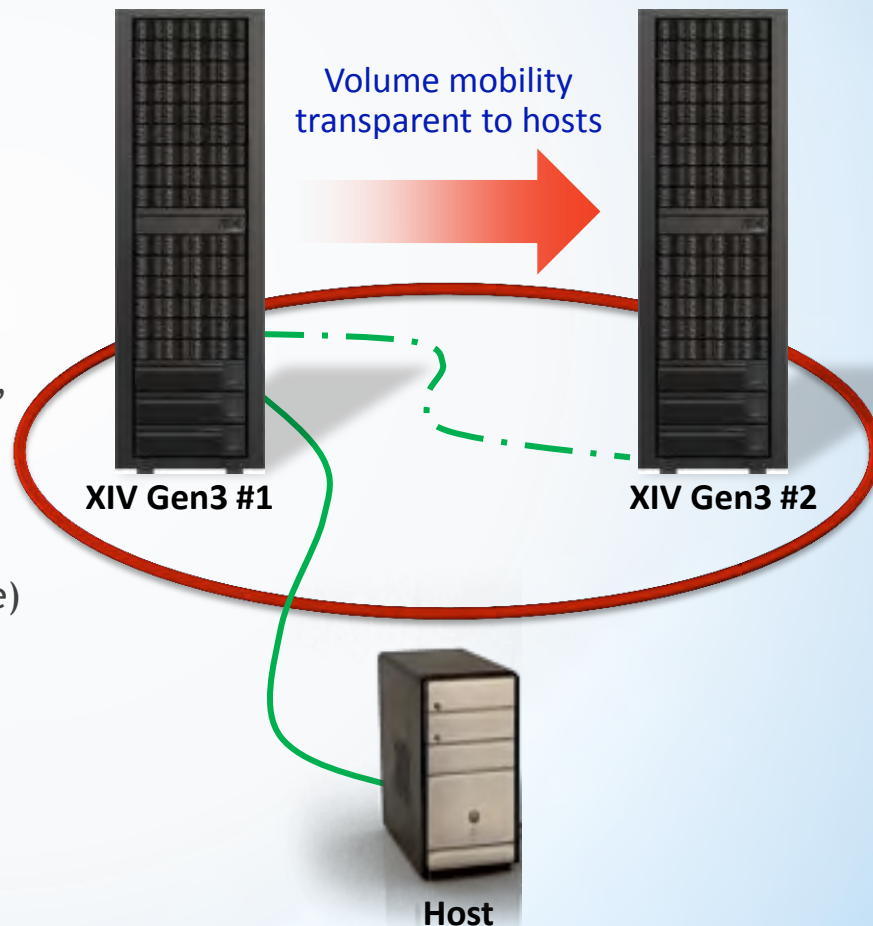
XIV Hyper-Scale Mobility enables Online Volume Migration

* What it is:

- Online, non-disruptive migration of volumes between XIV frames in a manner that is transparent to hosts

* Key benefits:

- Scale out capacity, performance, and host bandwidth across XIV systems (cloud, efficiency, ease)
- Execute aggressive thin provisioning for even greater capacity efficiency (efficiency)
- Move volumes between XIV models to accommodate shifting SLAs (cloud, performance)
- Flexibility to balance load across XIV systems (cloud)
- Retire an XIV system non-disruptively (ease, efficiency, availability)



HyperScale

XIV Storage Management

Systems | Actions | View | Tools | Help

admin msms-moshe-12

All Systems (39) Connectivity

Search (Ctrl+F)

Production 4 IOPS: 107

Production 3 IOPS: 49

Test 1 Redistributing (0%...

Test 2 IOPS: 45,515

Lab 6 Rebuilding (88%) (...)

Production 1 IOPS: 0

Search All

44 results found on all systems

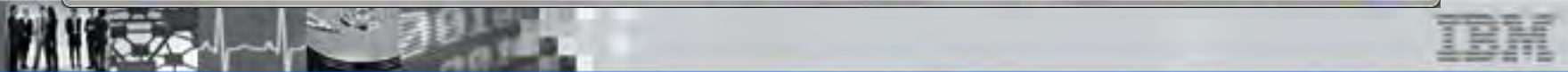
- Test_1
- Test_2
- il-bc08-b08-rhel56_64bit_test_alua-BFS / production_...
- il-bc08-b08-rhel56_64bit_test_alua-BFS / XIV MN00011c
- iqn.ran-test-port1 / ran-test-host / XIV hostdev21c
- iqn.ran-test-port2 / ran-test-host / XIV hostdev21c
- iqn.ran-test2-port1 / ran-test-host2 / XIV hostdev21c
- iqn.ran-test2-port2 / ran-test-host2 / XIV hostdev21c
- last-replicated-sra_int_test2 / sra_int_test2 / XIV ho...
- new_test-mir / SRA 2.1.1 / XIV hostdev21c
- ran-test-cluster / XIV hostdev21c
- ran-test-host / ran-test-cluster / XIV hostdev21c
- ran-test-host2 / ran-test-cluster / XIV hostdev21c
- ran_test / sra_int_test2 / XIV hostdev21c
- rantest_1_sec / SRM 4.1 / XIV hostdev21c
- rantest_1_sec / XIV hostdev21c

All Systems (39)

Soft: 721,949 of 4,017,889 GB (18%)

IOPS 75,576 Total

Rebuilding (88%)

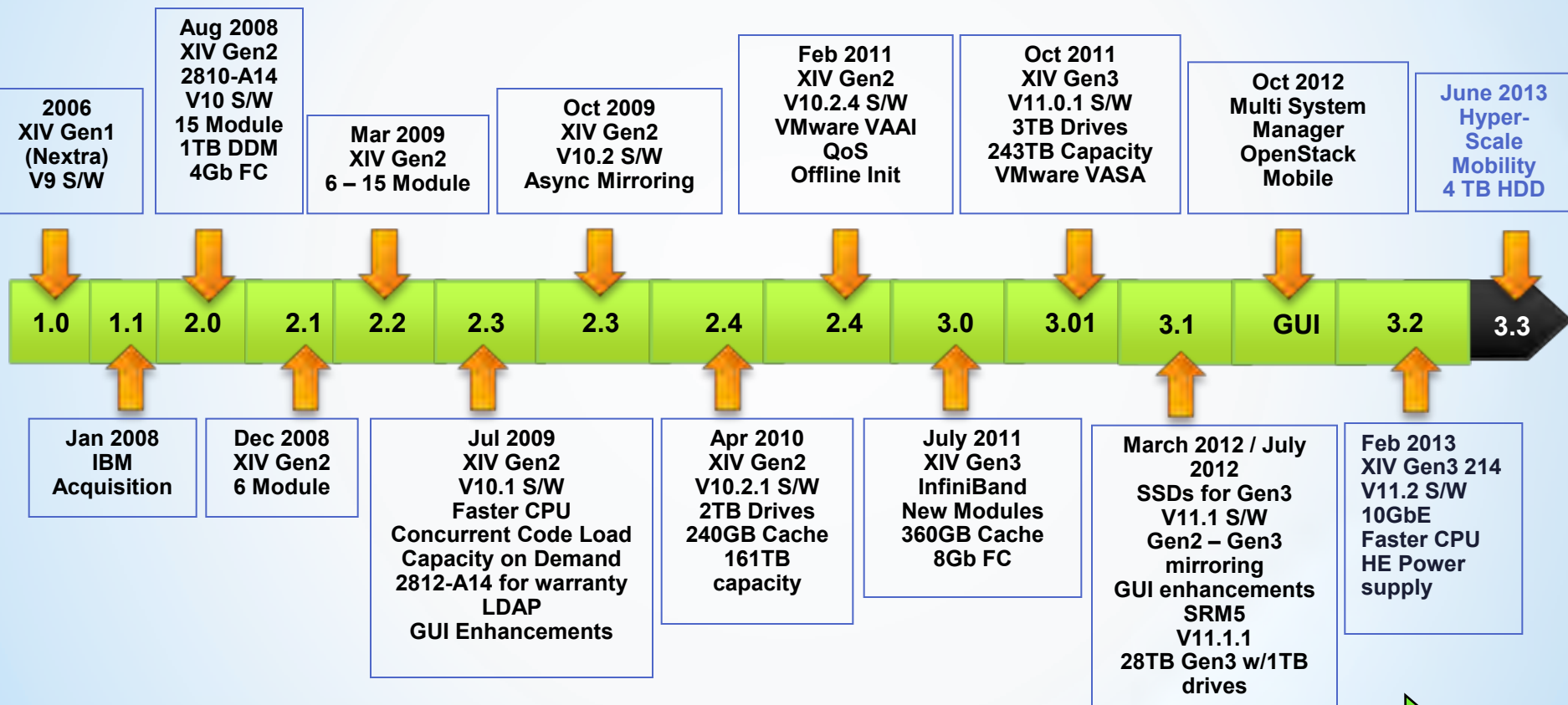


XIV Capacidad



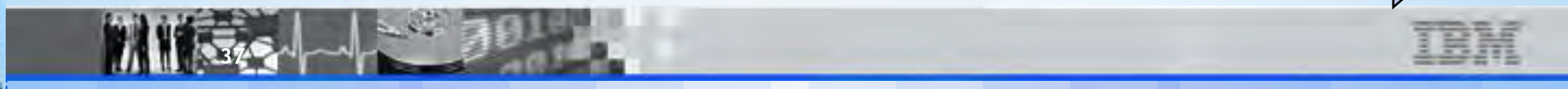
Ongoing evolution of the XIV Storage System

Note: not all enhancements are included



Thin Provisioning, Snapshot, Remote Mirroring included at No Charge

Ease of use Management Graphical User Interface (GUI)



XIV Gen3.3 - Rack Configuration Specifications

Rack Configuration

Total number of modules (Configuration type)	6 partial	9 partial	10 partial	11 partial	12 partial	13 partial	14 partial	15 <u>full</u>
Number of data modules	4	5	6	6	7	7	8	9
Number of active interface modules	2	4	4	5	5	6	6	6
Module 9 state		Disabled	Disabled	Enabled	Enabled	Enabled	Enabled	Enabled
Module 8 state		Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Module 7state		Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Module 6state	Disabled	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled	Enabled
Module 5state	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Module 4state	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
FC ports	8	16	16	20	20	24	24	24
iSCSI ports	6	14	14	18	18	22	22	22
Number of disks	72	108	120	132	144	156	168	180
Usable capacity (1 / 2 / 3 / 4 TB)	28 TB 55 TB 84 TB 112 TB	44 TB 88 TB 132 TB 177 TB	51 TB 102 TB 154 TB 207 TB	56 TB 111 TB 168 TB 225 TB	63 TB 125 TB 190 TB 254 TB	67 TB 134 TB 203 TB 272 TB	75 TB 149 TB 225 TB 301 TB	81 TB 161 TB 243 TB 325 TB
# of 6 core CPUs (one per Module)	6	9	10	11	12	13	14	15
Memory (24 GB per module w 1/2/3TB)	144	216	240	264	288	312	336	360
Memory (48 GB per module w/4TB)	288	432	480	528	576	624	672	720
{Optional } SSD Cache - TB	2.4	3.6	4.0	4.4	4.8	5.2	5.6	6.0
Power (kVA) -Gen3.2 / SSD	2.4 / 2.6	3.5 / 3.8	3.9 / 4.2	4.2 / 4.5	4.6 / 4.9	4.9 / 5.3	5.3 / 5.7	5.6 / 6.1

XIV CoD



Gen3 CoD Capacities- 3TB HDD

- Gen3 CoD program only supports from 1-3 un-activated modules
- White cells show standard capacity offered via CoD

3TB	6 CoD Modules	9 CoD Modules	10 CoD Modules	11 CoD Modules	12 CoD Modules	13 CoD Modules	14 CoD Modules	15 CoD Modules
Maximum Capacity -->	84,100	132,800	154,900	168,300	190,000	203,600	225,300	243,300
Capacity per CoD Activation -->	14,017	14,756	15,490	15,300	15,833	15,662	16,093	16,220
3 CoD Activations -->	42,050	44,267	46,470	45,900	47,500	46,985	48,279	48,660
4 CoD Activations -->	56,067	59,022	61,960	61,200	63,333	62,646	64,371	64,880
5 CoD Activations -->	70,083	73,778	77,450	76,500	79,167	78,308	80,464	81,100
6 CoD Activations -->	84,100	88,533	92,940	91,800	95,000	93,969	96,557	97,320
7 CoD Activations -->		103,289	108,430	107,100	110,833	109,631	112,650	113,540
8 CoD Activations -->		118,044	123,920	122,400	126,667	125,292	128,743	129,760
9 CoD Activations -->		132,800	139,410	137,700	142,500	140,954	144,836	145,980
10 CoD Activations -->			154,900	153,000	158,333	156,615	160,929	162,200
11 CoD Activations -->				168,300	174,167	172,277	177,021	178,420
12 CoD Activations -->					190,000	187,938	193,114	194,640
13 CoD Activations -->						203,600	209,207	210,860
14 CoD Activations -->							225,300	227,080
15 CoD Activations -->								243,300



XIV Gen 3 Performance



XIV Gen 3

Tucson Lab Testing Results

Single IO Latency	XIV Gen3	DS8000	DS8700
Read Hit in cache	170 us	180 us	160 us
Write Hit in cache	230 us	270 us	240 us

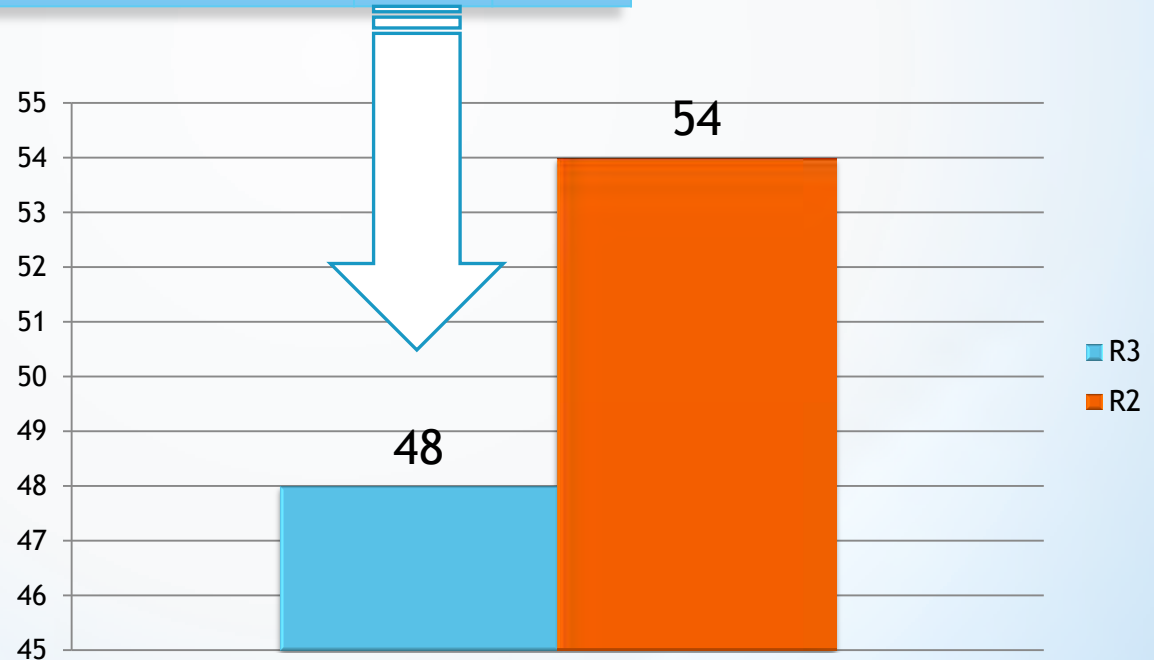
180
Disks!

Workload Tested	768 disks - RAID5 10k SAS DS8800 full frame max cache	240 disks - RAID5 DS8800 single frame	180 disks XIV Gen3
read hit 4KB (IOPs)	559,000	559,000	509,205
read hit 1MB (MB/sec)	16,500	NA	7,859 +
write hit 4K (IOPs)	223,000	223,000	370,921
write hit 1MB (MB/sec)	7,000	NA	6,938
read miss 4KB (IOPs)	165,000	61,000	23,164
read miss 1MB (MB/sec)	NA	NA	3,721
write miss 4KB (IOPs)	88,000	29,500	25,554
write miss 1MB (MB/sec)	NA	NA	4,460
seq read 1MB (MB/sec)	11,700	6,900	9,100
seq write 1MB (MB/sec)	6,600	5,500	4460

XIV Gen 3

Rebuild Improvement

Single Disk Idle Rebuild (2TB)		
100% capacity used	Gen3	Gen2
completion time (min)	48	54



What was great just
got even better!



XIV Gen 3 GUI





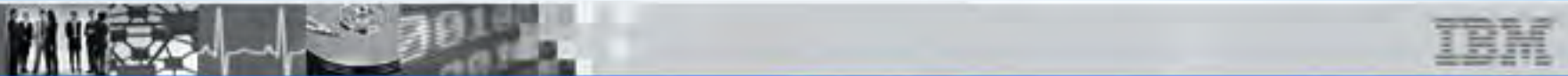
XIV GUI Ejemplo

Volumes and Hosts
Snapshots
Consistency Groups
Writable Snapshots
Resizing Volumes

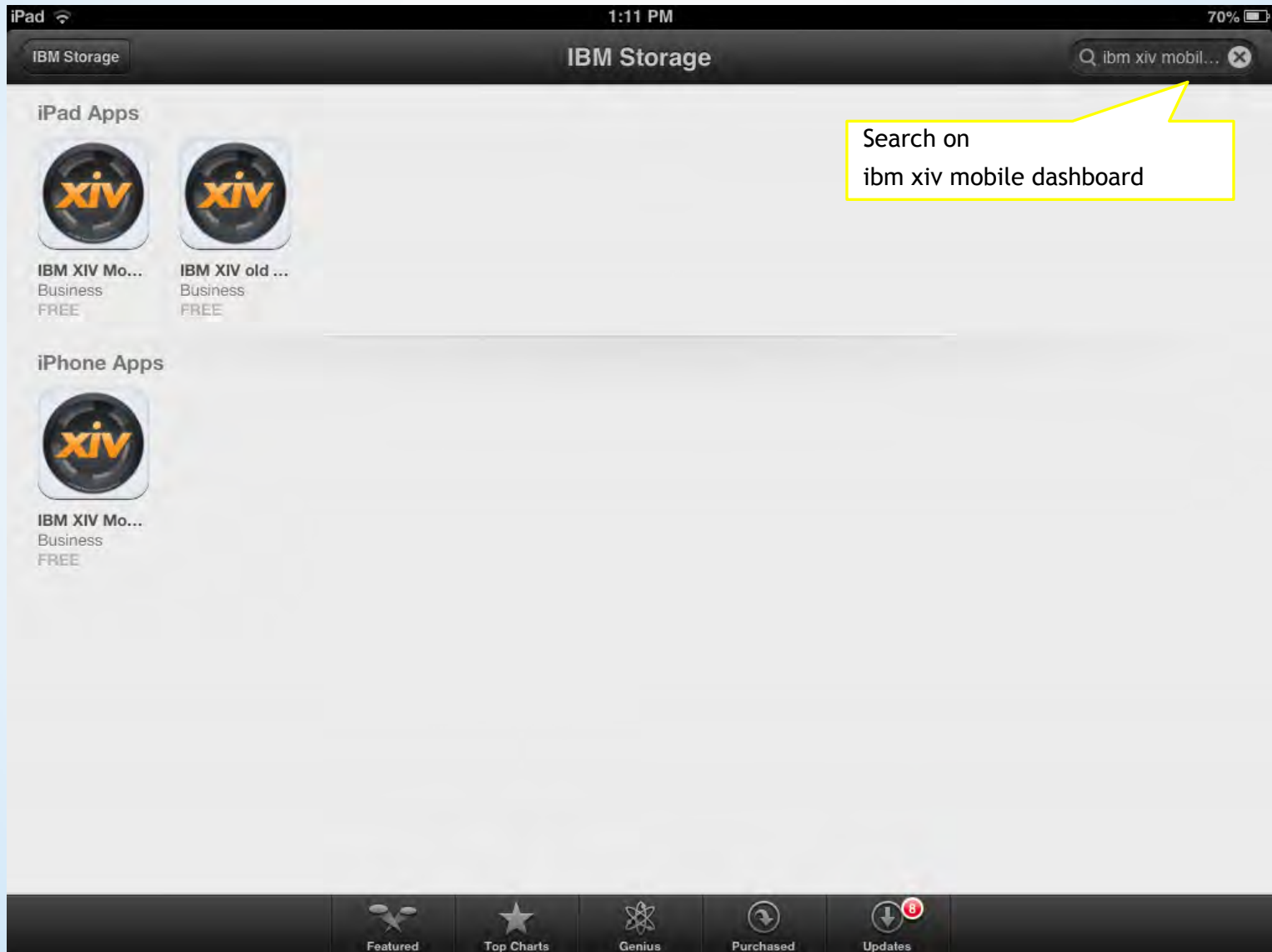
Sistema de planificación de recursos empresariales



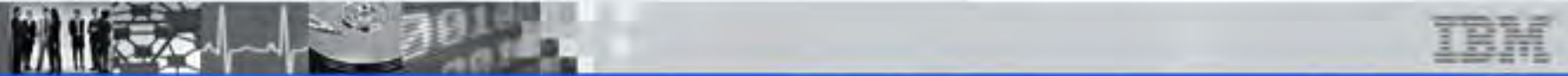
XIV Gen 3 GUI Ipad



XIV Mobile Dashboard - Free Download



Search on
ibm xiv mobile dashboard



Current Version - 1.2.1



IBM Storage

12:11 PM 82%

IBM Storage

IBM XIV Mobile Dashboard Universal App

IBM Storage

Business
No Ratings

OPEN

Details Ratings and Reviews Related

Information

Seller International Business Machines Corporation

Category Business

Updated Jan 3, 2013

Version 1.2.1

Size 35.9 MB

Rating 4+

Requires Compatible with iPhone 3GS, iPhone 4, iPhone 4S, iPhone 5, iPod touch (3rd generation), iPod touch (4th generation), iPod touch (5th generation) and iPad. Requires iOS 5.0 or later.

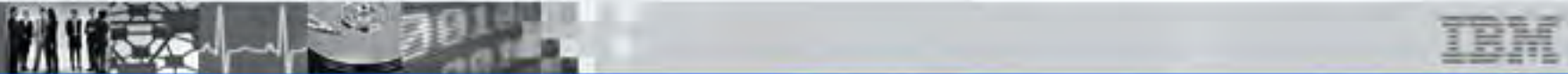
Developer Info

Version History

Version 1.2.1 Posted Jan 03, 2013

Current Version:

Featured Top Charts Genius Purchased Updates



New Features



iPad 12:11 PM 82%

IBM Storage

IBM Storage

IBM XIV Mobile Dashboard Universal App
IBM Storage

Business
No Ratings

OPEN

Details Ratings and Reviews Related

Version History

Version 1.2.1 Posted Jan 03, 2013

Current Version:

- Fixed various issues

Previous Version:... **More**

Version 1.2 Posted Dec 21, 2012

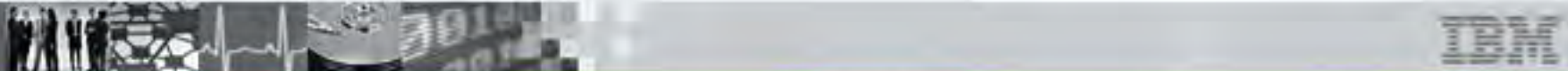
- Multi-system dashboard - Monitor multiple XIV systems
- Multi-system volumes/hosts views sortable by system or by other metric
- Multi System aggregated information (IOPS, Bandwidth, Capacity)
- Live streaming events view

Version 1.1.1 Posted Mar 27, 2012

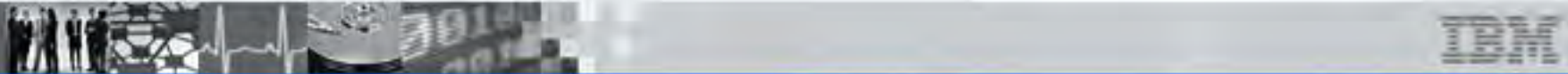
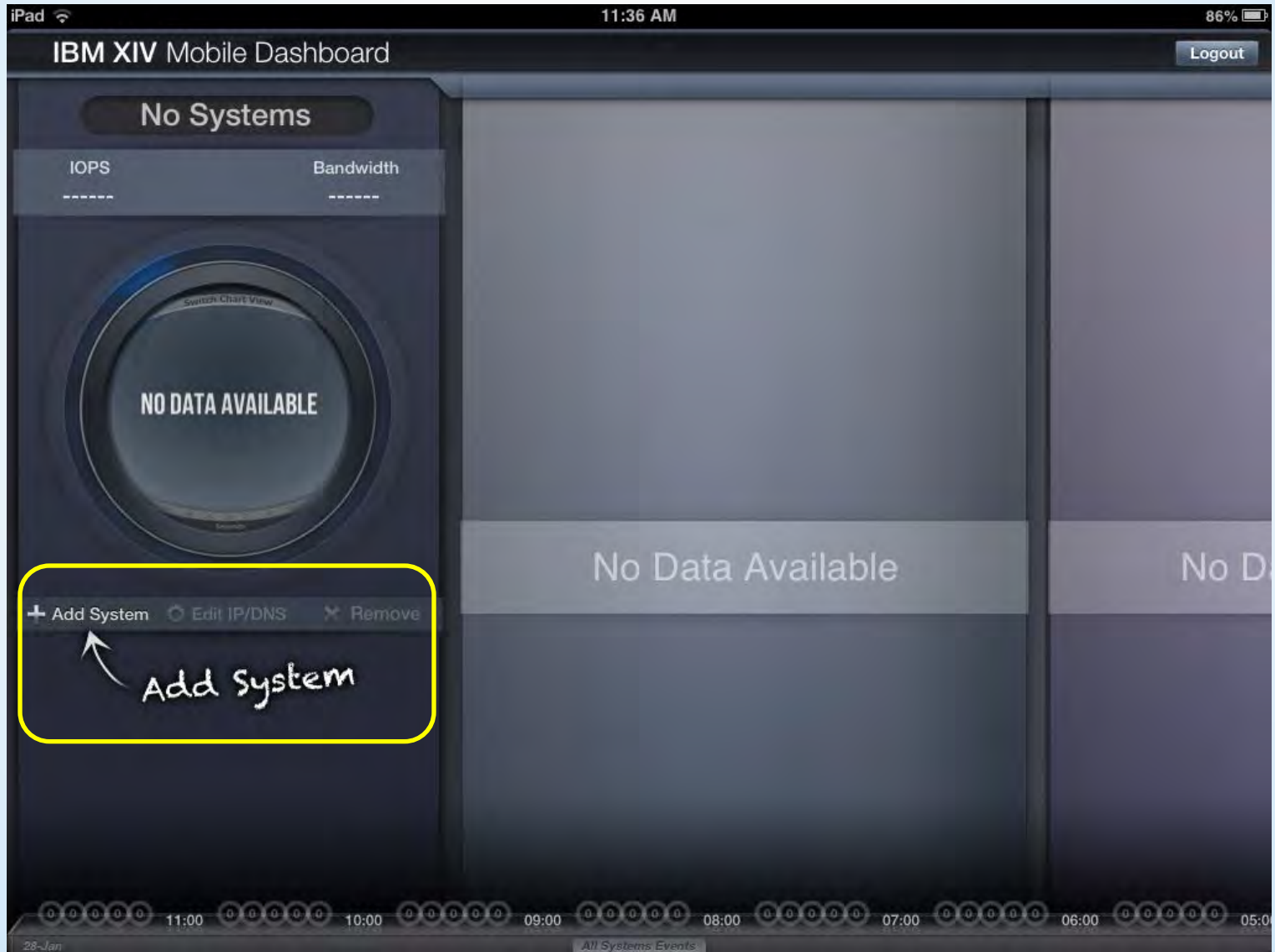
Featured Top Charts Genius Purchased Updates



Login Screen



Add System



Single System View

Overall section
List by Highest Volumes
List by Highest Hosts

WSC-6000639

IOPS: 142 | Bandwidth: 0.7MB/s

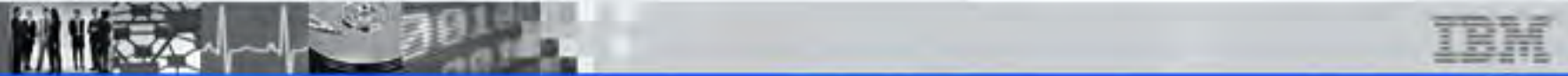
CURRENT IOPS: 142

Soft: 124.5TB Allocated of 154.5TB | Hard: 75.2TB Used of 77.3TB

9.82.30.49
Full Redundancy

WSC-6000639 - Highest Volumes by IOPS (172)			WSC-6000639 - Highest Hosts	
Volume	IOPS	Latency	Host	Bandwidth
MY_XIV639-..._VC_backup	27	0.9 ms	PT_Node_3	0.0 mb/s
JH_XIV639_ESX_158_D3	20	1.2 ms	MY_SAN3650-16	0.2 mb/s
MY_XIV639-...ASTORE_VC	15	1.6 ms	JH_odcc158	0.2 mb/s
MY_XIV639-...ASTORE_VC	8	0.0 ms	MY_BLADEHSVR3	0.2 mb/s
PT_NODE3	7	0.3 ms	MY_BLADEHSVR2	0.0 mb/s
PT_Node3_Data_4	6	0.4 ms	PT_Node_4	0.0 mb/s
PT_Node3_Data_3	6	0.3 ms	MY_BLADEHSVR1	0.0 mb/s
PT_Node3_Data_2	6	0.4 ms	MY_BLADEHSVR4	0.0 mb/s
PT_Node3_Rep_2	6	0.3 ms	WM_DEMO_SVC	0.0 mb/s
PT_Node3_Data_5	6	0.5 ms	SAN460_1_ESX	0.0 mb/s

Number of events: 2



Multi-system View

Overall section

List by Highest Volumes

List by Highest Hosts

IBM XIV Mobile Dashboard

All systems - Highest Volumes by IOPS (390) | All systems - Highest Hosts by

All systems

IOPS: 42928 | Bandwidth: 168.0MB/s

CURRENT IOPS: 42928

Hard: 253.9TB Used of 537.4TB | Soft: 3299.9TB allocated of 865.1TB

+ Add System | @S/LIP/DNS | Remove

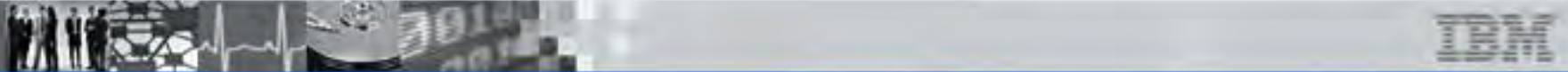
All Systems
4 connected

- 9.82.30.16 Full Redundancy
- 9.82.30.26 Full Redundancy
- 9.82.30.44 Full Redundancy
- 9.82.30.49

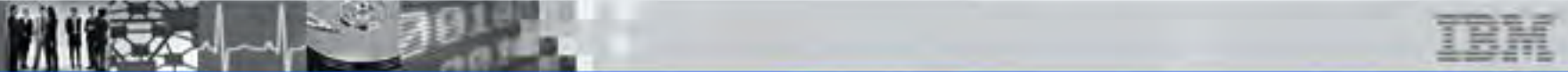
Bandwidth	IOPS	Latency
TEAM_SSD_010	22.8 mb/s	5843
TEAM_SSD_009	21.6 mb/s	5542
TEAM_SSD_013	13.5 mb/s	3462
TEAM_SSD_011	13.3 mb/s	3416
TEAM_SSD_012	10.8 mb/s	2759
TEAM_SSD_001	5.5 mb/s	1420
TEAM_SSD_021	5.3 mb/s	1356
TEAM_SSD_025	5.2 mb/s	1321
TEAM_SSD_005	5.1 mb/s	1302
TEAM_SSD_024	5.0 mb/s	1282
TEAM_SSD_019	4.9 mb/s	1265

Bandwidth
RMM_SAN3550_1
PT_Node_3
MY_SAN3650-16
MY_BLADEHSVR4
JH_odccl158
DR_P570_VIO1
MY_BLADEHSVR1
MY_BLADEHSVR3
MY_BLADEHSVR2
PT_Node_4
WM_JB_SONAS2_No

01-Feb | All Systems Events



Volumes Chart View - Sort by Latency



Volumes Chart View - Sort by IOPS

Sort by IOPS

IBM XIV Mobile Dashboard

All systems - Volumes chart view (337)

All systems - Highest Hosts by Bandwidth

All systems

IOPS: 2156

Bandwidth: 70.8MB/s

CURRENT IOPS
2156

2.5K 1.5K 710

Hard: 238.4TB Used of 867.4TB

Soft: 314.1TB Allocated of 867.1TB

0 IOPS

Add System Exit IP/DNS Remove

All Systems
3 connected, 1 connecting

9.82.30.16
Full Redundancy

9.82.30.26
Full Redundancy

9.82.30.44
Full Redundancy

9.82.30.49

Bandwidth	IOPS	Latency
DR_HP_001	0.0 mb/s	0
WSC-1300331	0.0 ms	6.7
TEAM02_VM...d_Datastore	0.0 mb/s	0
WSC-1300331	2.0 ms	4.9
TEAM07_VM...d_Datastore	0.0 mb/s	0
WSC-1300331	1.4 ms	3.1
TEAM05_VM...d_Datastore	0.0 mb/s	0
WSC-1300331	2.0 ms	1.4
TEAM03_VM...d_Datastore	0.0 mb/s	0
WSC-1300331	1.4 ms	
TEAM04_VM...d_Datastore	0.0 mb/s	10
WSC-1300331	2.0 ms	
TEAM0C_VM...d_Datastore	0.0 mb/s	0
WSC-1300331		

Bandwidth

JH_3000136

69.7 mb/s

MY_ODC192136

0.3 mb/s

MY_SAN3650-16

0.2 mb/s

MY_BLADEHSVR4

0.2 mb/s

MY_BLADEHSVR3

0.1 mb/s

MY_BLADEHSVR1

0.1 mb/s

MY_BLADEHSVR2

0.0 mb/s

MY_vESXi_19_49

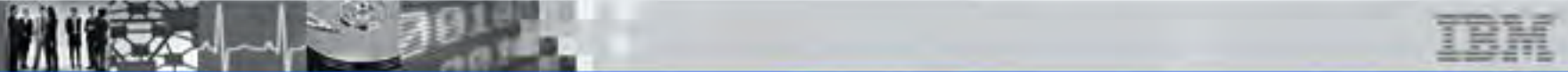
0.0 mb/s

WM_DEMO_SVC

0.0 mb/s

28-Jan 12:00 11:00 10:00 09:00 08:00 07:00 06:00

All Systems Events



Volumes Chart View - Sort by Bandwidth

Sort by Bandwidth

IBM XIV Mobile Dashboard

All systems - Volumes chart view (337)

All systems - Highest Hosts by

All systems

IOPS: 86 Bandwidth: 1.9MB/s

[+ Add System](#)
 [Edit IP/DNS](#)
 [Remove](#)

All Systems
4 connected

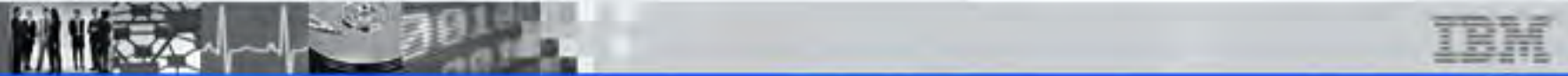
- 9.82.30.16
Full Redundancy
- 9.82.30.26
Full Redundancy
- 9.82.30.44
Full Redundancy
- 9.82.30.49

Bandwidth	IOPS	Latency
JH_XIV639_ESX_158_D4 0.0 mb/s	3	0.0 ms
MY_XIV639-..._VC_backup 0.0 mb/s	3	4.1 ms
MY_XIV639-...ASTORE_VC 0.0 mb/s	6	2.5 ms
JH_XIV639_ESX_158_D1 0.0 mb/s	3	0.0 ms
MY_XIV639-...in7_Images 0.0 mb/s	4	0.8 ms
MY_XIV639-...E_TPCR-138 0.0 mb/s	1	0.0 ms
JH_XIV639_ESX_158_D2 0.0 mb/s		

Bandwidth

- PT_Node_3: 0.0 mb/s
- MY_SAN3650-16: 0.1 mb/s
- WM_DEMO_SVC: 1.2 mb/s
- MY_BLADEHSVR4: 0.3 mb/s
- JH_odccl158: 0.1 mb/s
- MY_BLADEHSVR3: 0.1 mb/s
- MY_BLADEHSVR1: 0.1 mb/s
- MY_BLADEHSVR2: 0.0 mb/s
- PT_Node_4: 0.0 mb/s
- SAN460_2_ESX: 0.0 mb/s
- MY_vESXi_19_49: 0.0 mb/s

28-Jan All Systems Events



Hosts Chart View - Sort by Latency

Sort by Latency

iPad 12:31 PM 78%

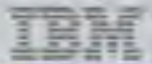
IBM XIV Mobile Dashboard Logout

All systems - Highest Volumes by IOPS (337) All systems - Hosts chart view (55)

Bandwidth	IOPS	Latency
JH_XIV639_ESX_158_D2	1754	1.3 ms
JH_XIV639_ESX_158_D3	1154	23.6 ms
JH_XIV639_ESX_158_D4	26	9.4 ms
MY_XIV639_...STORE_ESXi	19	1.0 ms
MY_XIV639_...STORE_ESXi	19	1.0 ms
MY_XIV639-..._VC_backup	16	0.0 ms
MY_XIV639_...ASTORE_VC	13	0.0 ms
JH_XIV639_ESX_158_D1	4	0.0 ms
MY_XIV639_...ATASTORE_1	4	0.0 ms
MY_XIV639_...E_TPCR-137	3	32.2 ms
MY_XIV639_...in7_Images	3	65.5 ms

Bandwidth	IOPS	Latency
JH_odccl158	2930	10.2 ms
WM_DEMO_SVC	0	0.0 ms
MY_BLADEHSVR5	3	32.1 ms
MY_vESXi_19_44	0	2.0 ms
MY_vESXi_21_212	0	0.0 ms
MY_vESXi_21_214	0	0.0 ms

28-Jan All Systems Events



Events by System View

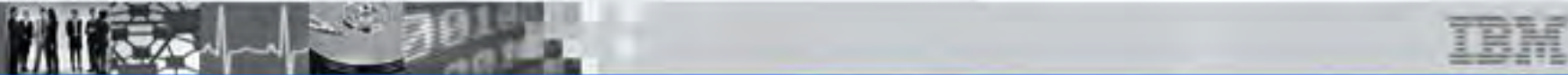
Severity System

Events by System (28-Jan 09:00 - 10:00)

By System

Select Time Period

Severity	System	Time	Message
Warning	ATXSXIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSXIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Info	ATXSXIV-1310115	Jan 28 09:30:45	Volumes were restored from Snapshot Group with name 'team10.gold'.
Info	ATXSXIV-1310115	Jan 28 09:32:22	Volume with name 'team10.gold.TEAM10_MASTER_2' was deleted.
Info	ATXSXIV-1310115	Jan 28 09:32:22	Volume with name 'team10.gold.TEAM10_MASTER_1' was deleted.
Info	ATXSXIV-1310115	Jan 28 09:32:22	All Snapshots in Snapshot Group with name 'team10.gold' were deleted.
Info	ATXSXIV-1310115	Jan 28 09:32:22	Volume with name 'team10.test.TEAM10_MASTER_2' was deleted.



Events by Severity View

iPad 12:33 PM 78%

Severity System

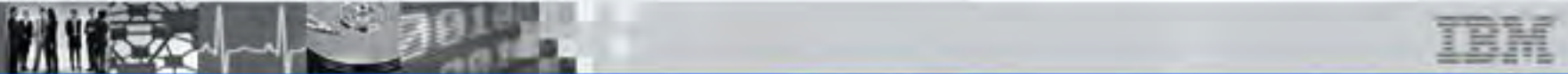
Events by Severity (28-Jan 09:00 - 10:00)

By Severity on all systems

Severity	Event ID	Time	Description
Warning	XIV-1340004	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	XIV-1340004	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	XIV-1340004	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	XIV-1340004	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	ATXSIV-1310115	Jan 28 09:30:32	User 'default' from IP '127.0.0.1' failed logging into the system.
Warning	WSC-1300331	Jan 28 09:55:44	User 'team21' from IP '192.168.19.127' failed authentication when trying to run command '
Warning	WSC-1300331	Jan 28 09:55:44	User 'team21' from IP '192.168.19.127' failed authentication when trying to run command '

9.82.30.16
9.82.30.20

28-Jan All Systems Events



Demo Mode

iPad 1:01 PM 72%

IBM XIV Mobile Dashboard

All systems - Highest Volumes by IOPS (407) All systems - Highest Hosts by

All systems

IOPS: 74341 | Bandwidth: 8765.0MB/s

5 connected systems:

- demo system 1 (Full Redundancy)
- demo system 2 (Full Redundancy)
- demo system 3 (Full Redundancy)
- demo system 4 (Full Redundancy)

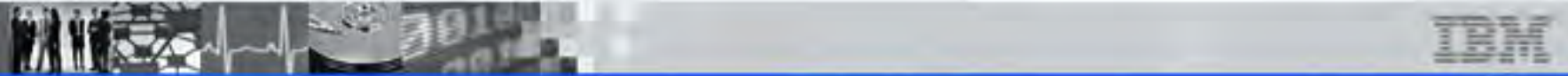
Bandwidth	IOPS	Latency
Home folders	76.4 mb/s	666
Demo6	60.4 mb/s	604
Demo6	53.4 mb/s	534
Demo5	59.4 mb/s	507
Backup	47.2 mb/s	472
Demo volume1	43.1 mb/s	431
Demo7	62.8 mb/s	430
Demo5	42.6 mb/s	426
Demo5	51.2 mb/s	425
Home folders	52.2 mb/s	424
Demo7	61.8 mb/s	420

Bandwidth

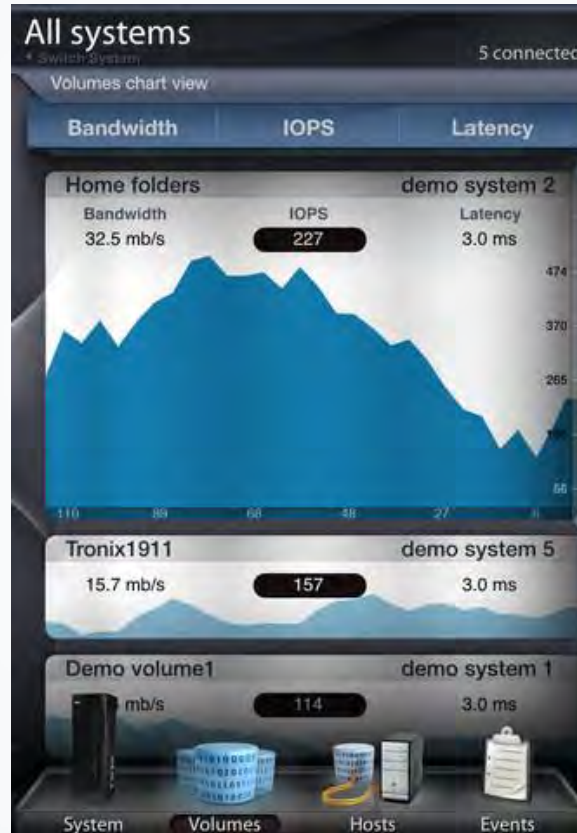
- DC0: 23.7 mb/s
- ERP Server1: 8.4 mb/s
- ERP Server1: 31.1 mb/s
- ERP Server1: 28.1 mb/s
- ERP Server1: 17.4 mb/s
- ERP Server1: 30.7 mb/s
- Host 5: 45.1 mb/s
- Host 5

28-Jan 13:00 12:00 11:00 10:00 09:00 08:00 07:00

IBM XIV Mobile Dashboard



Views on iPhone or Android



RESUMEN

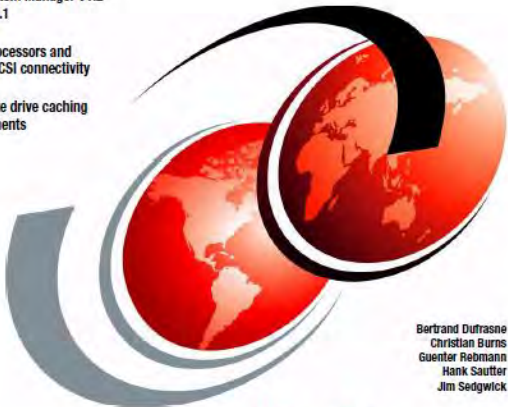
- * Self heal and tune nearly eliminating hot spots
- * Provide 100% usable capacity
- * Consistent performance without tuning
- * Super fast drive rebuilds -- a 2 TB drive failure < 1 hour
- * Dynamically add new capacity and automatically rebalance
- * Deploy new arrays in a half day!
- * Learn to manage XIV in under 4 hours
- * Provision new storage in about 1 minute
- * Use standard OS provided Multi-Path I/O (MPIO)
- * Provide a full, robust set of standard features:
 - * High performance, space efficient Snapshots with FlashCopy Manager support
 - * Thin provisioning: with no volume/data conversion needed!
 - * Performance monitoring
 - * Capacity monitoring
 - * Remote replication: metro(sync) & global(async)
 - * Online Data migration: no host resources
 - * Simple lightweight storage manager: no server needed, installs in < 10 minutes



IBM

IBM XIV Storage System Gen3 Architecture, Implementation, and Usage

- Multi-System Manager V1.2 and GUI 4.1
- Faster processors and 10 GbE iSCSI connectivity
- Solid-state drive caching improvements



Bertrand Dufresne
Christian Burns
Guenter Rebmann
Hank Sautter
Jim Sedgwick

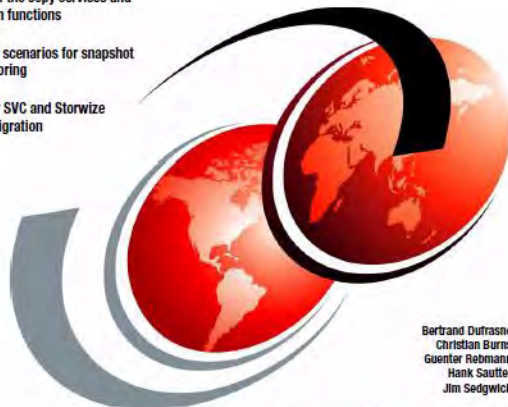
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IBM

IBM XIV Storage System Copy Services and Migration

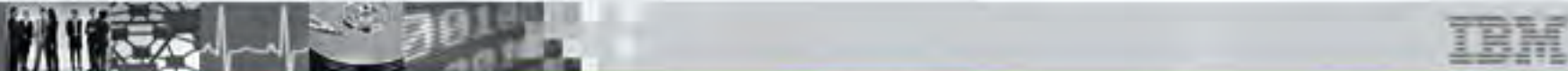
- Details of the copy services and migration functions
- Practical scenarios for snapshot and mirroring
- Steps for SVC and Storwize V7000 migration



Bertrand Dufresne
Christian Burns
Guenter Rebmann
Hank Sautter
Jim Sedgwick

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Muchas Gracias
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