Talking Efficiency - IBM XIV

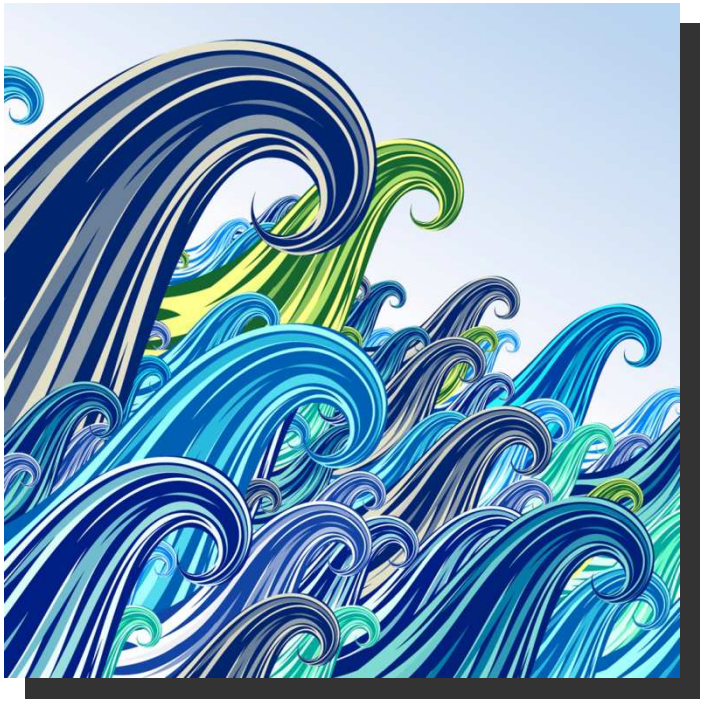
Optimized systems.
Optimal innovation.

AGENDA

Talking Efficiency

- Where can we gain more storage efficiency?
- How does XIV drive up efficiency levels?
- With whom and where is XIV delivering efficiency?

The Tidal Wave of Data Growth Continues …



Volume
Every day, **15 petabytes** of new information are being generated…and increasing.

Variety
80% of new data growth is unstructured content, generated largely by email, with increasing contribution by documents, images, and video and audio.

We Need to do More with Less, and we need to do it smarter

Efficiency

Efficiency [ih-**fish**-*uh*ˈn-see]

***noun, plural* -cies.**

1. the state or quality of being efficient; competency in performance.
2. accomplishment of or ability to accomplish a job with a minimum expenditure of time and effort: *The assembly line increased industry's efficiency.*
3. the ratio of the work done or energy developed by a machine, engine, etc., to the energy supplied to it, usually expressed as a percentage.

We Need to do More with Less, and we need to do it smarter

Improving Efficiencies … What if …

- What if …
  - On-going, often hidden, software costs were killed off
  - Complicated RAID protection was a thing of the past
  - Complex multi-tier architectures were eliminated
  - Managing storage was just about capacity
  - You could manage more with the resources you have today
  - Performance tuning and hot-spots were no longer a concern
  - Orphaned space could be used capacity rather than wasted
  - The pricing was predictable and based on data stored

Welcome to XIV!

Where can we make storage efficiency improvements…

- Acquisition costs and TCO
- Environmentals
- Management and manageability
- How data is stored

Acquisition and TCO…

- Many legacy vendors still try and sell you raw TBs.
  – What are you actually storing?? Answer: Data!!!
- Example:
  – 100TB of raw capacity relates to approx 70TB of useable capacity
  – Typical server storage utilisation is 30-40% of useable
  – Data stored therefore is only 20-30TB
- If you're buying raw TB at €5k per TB, your real cost of storage is:
  – 100 x €5k = €500k (€25k per usable TB)
  – Versus 20 x €5k = €100k
- ***How do you buy your storage?***
- ***XIV Storage is based on usable capacity – ie. data written and capacity can be utilised to over 95%* - if you need 50TB for your application, with XIV you purchase 50TB of useable capacity!***

*Actually [illegible] contingency

Acquisition and TCO…

- Several years ago, many storage vendors realised the "*cash-cow*" of royalty based licensing
  - Some vendors employ licensing models that require a new license for every piece of software functionality
  - Force you to buying more licenses as you grow, based on capacity, host connectivity or disks
- Hidden charges as you scale
  - License charges apply as you grow, plus support - for both production and DR sites
- ***Are you tied into an inefficient/costly storage licensing model?***
- ***XIV licensing model is "all-in" – no additional licenses and NO surprises!***
  - *Includes: Snapshots, clones, sync replication, async replication, migration tools, VMware VAAI, performance monitoring, performance collection, GUI, CLI, Thin-Provisioning, host attachment kits, VMware vCenter plugin, MS SCOM integration, VMware SRM, MSCS plugin, Solaris/Veritas agents, Async Truck mode initialization, RAID-X, iSCSI protocol, FC protocol, consistency groups, automatic performance tuning, automatic healing …*

IBM XIV for Smart Data Centers

reduce total costs

1	Lower Acquisition Cost: HW & SW	20-30%+

XIV vs EMC VMAX. Source ITG White Paper, 2011

Environmental …

- Power, space, cooling and heat – all elements of the environmental overhead that you suffer with many legacy storage arrays
- Until recently the way to deliver storage was via high speed, fast spinning disks
  - These are power hungry, space consuming and pump out heat … which in turn require cooling
  - With larger capacity disks continually announced, short stroking has become more common - a fraction of a large disk used to deliver performance, but not capacity = lower utilisation and increased inefficiency!
- Legacy storage solutions have struggled to deliver performance and decent protection when using larger, denser, more efficient disks …
  - SSDs have helped performance to a certain extent – but this drives up cost per TB, and decreases utilisation!
  - But SSDs don't help the RAID rebuilds … which can typically be hours or days … Unlike XIV's 30mins/TB
- ***How environmentally efficient is your storage solution?***
- ***XIV's approach utilises high capacity power efficient disks – with a grid based architecture to deliver performance, this combined with Thin-Provisioning & Space Reclamation allows you to store dramatically more data per useable TB than legacy based storage solutions.***

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reduce environmentals

1	Lower Acquisition Cost: HW & SW	↓ 20-30%+
2	Reduce Power, Space & Cooling: Facilities Cost	↓ 25-50%+

Management and manageability

- For many years storage solutions have relied on complex technologies and have been a challenge to administer
  - RAID for protection, sparing coverage for disk recovery, multiple disk sizes and speeds for different workloads, host connection management, performance monitoring etc etc.
- Legacy storage solutions have promoted highly bespoke and configurable
  - In reality this approach drives up complexity and inefficiencies, to a point where the burden outweighs the original benefit
- The approach of many vendors is to mask the complexity with expensive tools and utilities … *Mask, but not eliminate!!*

- ***How do you manage your storage? How much time do you take up managing your storage on a daily/weekly basis?***
- ***The XIV Storage solution truly removes the complexity of managing storage – no more RAID, sparing, performance tuning, disk sizes/speeds … just capacity.***

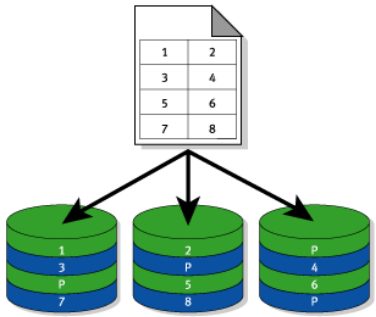
Management and manageability

Extreme Ease-of-Use

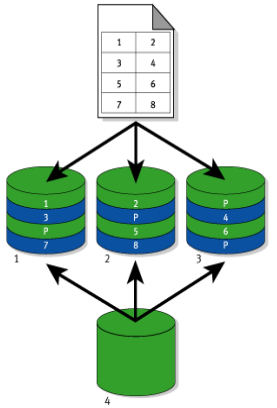
- Breakthrough GUI
- Exceptional ease of use
- Powerful management capabilities
- Easy, rapid provisioning
- Minimal administration
- Minimal training required

Efficiency: What you won't need to manage with XIV …

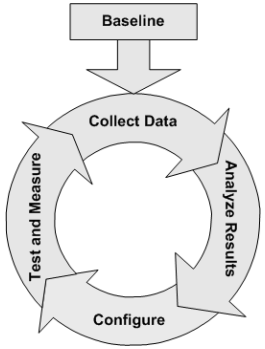
- RAID… 0,1,3,4,5,6,xx



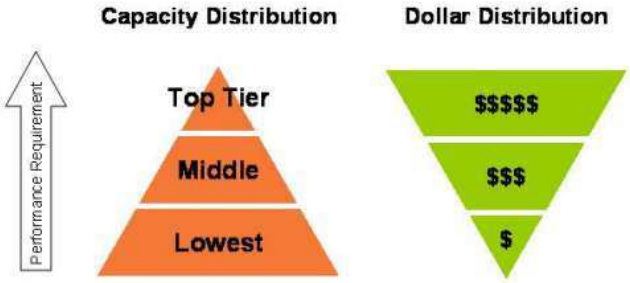
- Hot-Spares… and how many!



- Performance Tuning



- Multi-Tier Storage with XIV



IBM XIV for Smart Data Centers

reduce total costs

reduce environmentals

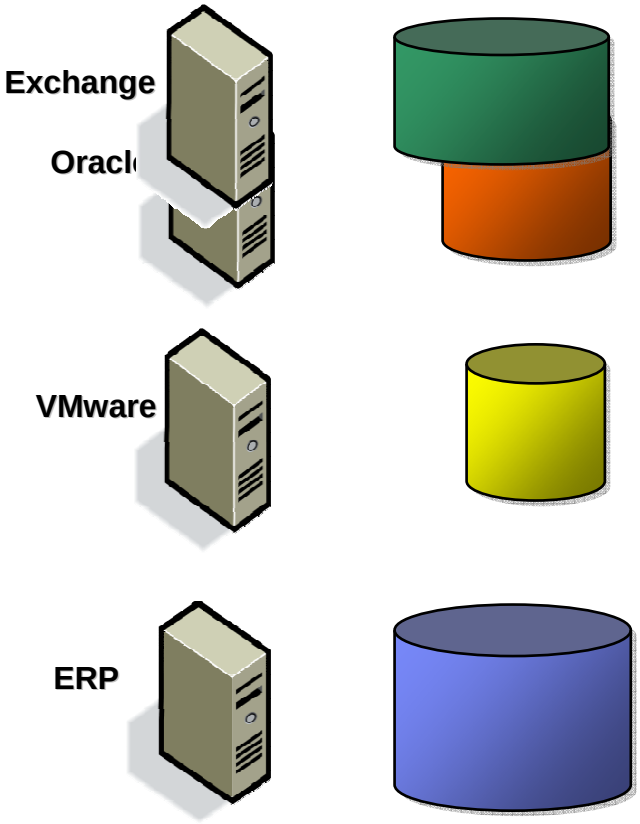
reduce management & operations costs

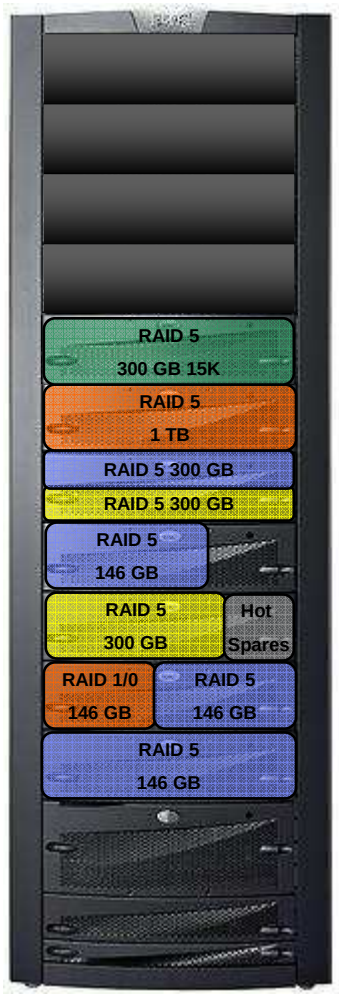
1	Lower Acquisition Cost: HW & SW	↓ 20-30%+
2	Reduce Power, Space & Cooling: Facilities Cost	↓ 25-50%+
3	Reduce Storage Management & Operational Costs	↓ 50-80%+

How data is stored …

- The traditional process of storing data was to use RAID groups, create volumes and provision to a server
  - Different disk sizes, technologies and speeds for performance combined into RAID sets. With multiple RAID sets for either protection or performance.
- Storage vendors love this approach
  - It's inefficient, lots of unusable orphaned space, they sell you more capacity, more licenses etc etc.
  - Migration tools and expensive services engagements are used to move data from one storage area (RAID) to another, more licenses!
- Vendors tried to help with the inefficiency by the retro-fitting technologies
  - Thin Provisioning helps utilisation, but many legacy storage systems struggle as they weren't originally designed to be used with this technology
  - De-duplication was touted as next storage reduction technique – but has impact on performance, can increase management overhead and doesn't always deliver
- ***How do you store your data? Is your data stored efficiently?***
- ***XIV has been designed from the floor up with Thin Provisioning, and space reclamation inbuilt. It uses high capacity disks & suffers no orphaned capacity***

Efficiency Review: ***Traditional*** Storage Distribution



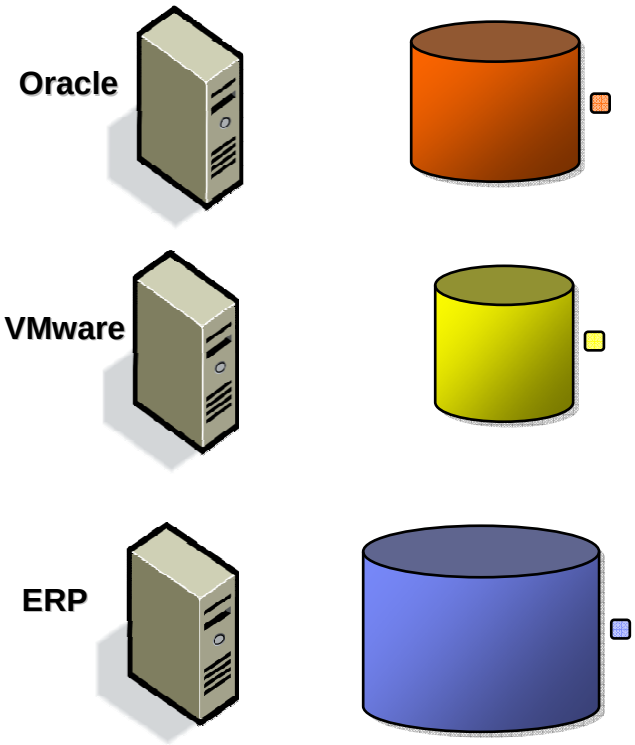


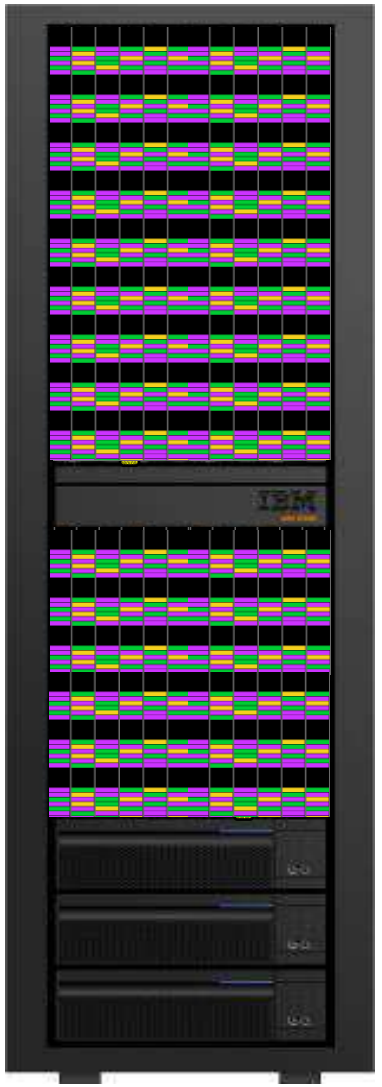
- Additional applications workloads may require new RAID sets
- Potential for increase in utilisation
- Multiple RAID sets orphaned space
- Scalability is limited and not linear
- Capacity is added but performance is reduced
- To improve performance, a redesign/relayout is required
- Lots of work to keep and maintain this array

Hot Spots and Performance issues require analysis, design and tuning

Efficiency Review: XIV Storage Distribution

Ground-breaking Architecture





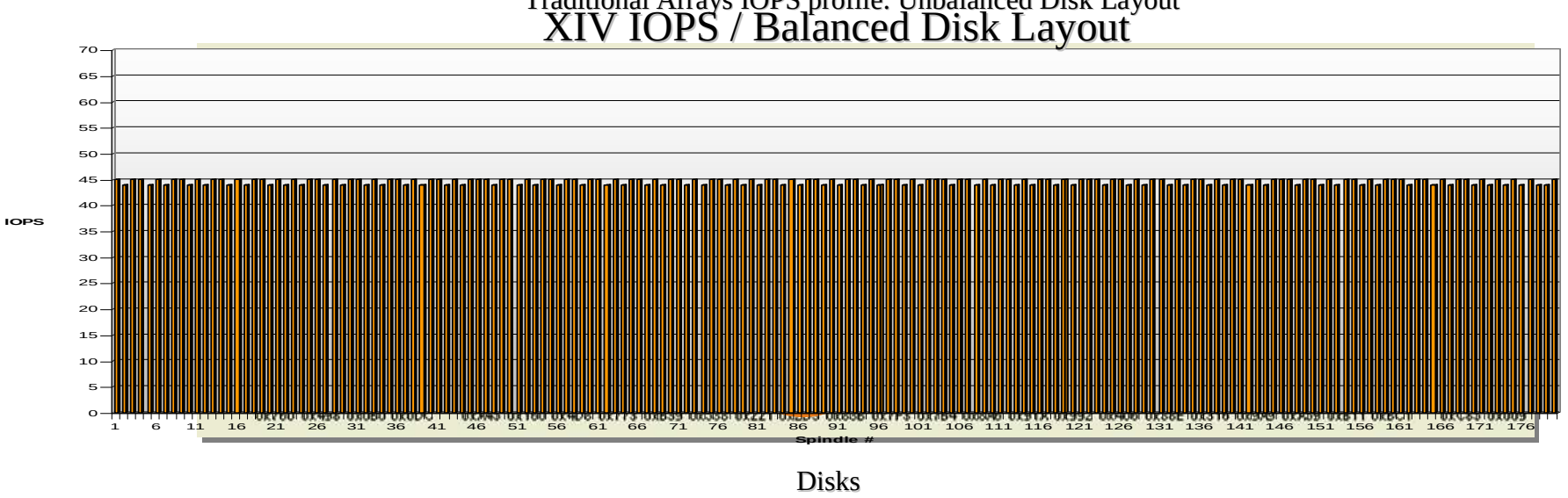
- Data is spread across all drives
- Thin Provisioned
- Even Disk utilization
- NO manual intervention
- No Tuning
- No Hot-Spots

Efficiency Review: XIV vs Traditional Architecture Disk Utilization

- The result?

We go to this…

Traditional Arrays IOPS profile: Unbalanced Disk Layout



Disks

IBM XIV for Smarter Data Centers

reduce total costs

reduce environmentals

reduce management & operations costs

increase utilization

1	Lower Acquisition Cost: HW & SW	↓ 20-30%+
2	Reduce Power, Space & Cooling: Facilities Cost	↓ 25-50%+
3	Reduce Storage Management & Operational Costs	↓ 50-80%+
4	Increase Capacity Utilization	↑ 20-50%

XIV vs EMC VMAX. Source ITG White Paper, 2011

XIV Efficiency … Digging Deeper …

- Elimination of many complexities enables storage administrators to manage more!
  - One UKI organization has rationalized and morphed DBA's into storage administrators
  - Another media company allows half an administrator to manage circa 200TB of capacity
- XIV – so simple to use, that the official UK IBM Training Course doesn't run!
  - A Channel Island banking organisation had sufficient knowledge after ½ day of web based skills transfer to enable them to migrate data from their legacy storage arrays to XIV
- IBM install, service & maintain – no customer replaceable/serviceable parts
  - Self healing, self tuning cutting down on the management overhead
- Predictable pricing: All hardware, software & service for the capacity of the box.
  - Enable you to understand storage costs today and map into the future.

Efficiency World Wide …

4,300+ Ships

1000+ New Customers

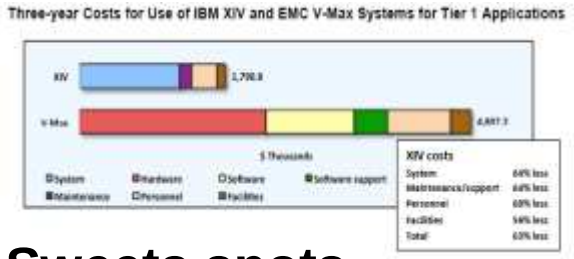
Performance: SAP/Oracle:
EMC DMX to XIV – 2X capacity 60% Cap-Ex Reduction 5-6X Performance Sustained Through Failures.
Migration – Exchange
300 % faster in benchmark over EMC DMX and HP EVA. Twice as fast , ½ of XIV disabled
Ease of Management: SAS/Oracle
HP EVA to XIV, 2X Performance 40% TCO Reduction, 30% Throughput Increase Saving Money, Exceeding SLAs
VMware
70% systems using Vmware, 100% of storage virtualized
Cost
EMC DMX to XIV VMware | Windows | Unix
$2.6M CapEx Savings Outperforms EMC w/ Lower Human, Capital Cost.
Replaced 2- DMX-3 saved customer $7.4M

Then - Announcement
"For many workloads, this type of storage system appears to be the future of storage, offering lower acquisition cost, increased flexibility of data management, massive scalability and much easier management" FORRESTER

And Now - 1 year later
"XIV could well be a piece of computer history in the making because its guiding light, when at EMC, once took on and beat IBM at its own game. Could EMC's former benefactor and acknowledged storage maven now become its biggest enterprise storage headache? Quite possibly." -- John Webster, Principal IT Adviser, Illuminata cnet news

2010 Data Center Wish List
More Money, Virtualization, Cloud Computing…and IBM's XIV enterprise storage system eWEEK.com

20 tier 1 customers tell all



50%
Improvement in SLA

63%
Savings

Sweets spots

vmware sas ORACLE SAP Microsoft Exchange LAWSON amdocs

leumi Bezeq International Getronics Mees Pierson JoongAng Ilbo NaviSite Run With Us. Welch's Intertrust Carilion Clinic

IRON MOUNTAIN PHILIPS ACXIOM MAYO CLINIC vodafone GEICO Liberty Mutual INOVA HEALTH SYSTEM PANGEA3 Slovak Telekom TRINITY HEALTH St. Luke's HOSPITAL PAPA JOHNS Fidelity McKinsey&Company PRADA Conforama J.B. HUNT

LA-Z-BOY TOSHIBA Capgemini Telekom Srbija CIGNA Colgate ACE Hardware AmBank Group MCKESSON MetLife PEARSON STATE STREET

1First Bank celcom Coca-Cola Bell Pfizer ui IKON JCPenney PERDUE HBO AIG ups COLUMBIA UNIVERSITY HBO

XIV Efficiency UKI …

Boxes Installed – 300+

Number of customers – 100+

Sectors - All

Platforms – All – Unix, Windows, Linux, VM, zLinux etc etc.

Applications in production:

SAP, SAP ECC, SAP ERP, Domino, SQL, Exchange, Sharepoint, Remedy, Navision, JD Edwards One World Oracle, Oracle Enterprise, Oracle E-Business, Sunguard Banner, File and print and Web Hosting

Some examples……..


Finance
Northern Trust
ING DIRECT
Mees Pierson
BARCLAYS
MARKEL INSURANCE COMPANY
FORTIS
ING
Intertrust
Brit Insurance
Lloyds TSB
Gov. Orgs
Ofcom
McKESSON
Empowering Healthcare
ECMWF
BMA
serco
Comms/Media
sky
THOMSON REUTERS
Virgin media
TalkTalk
WPP
Reed Elsevier
Public Sector
THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA
Nottinghamshire County Council
London Borough of Hounslow
Dundee City Council
Economic Development
SOUTH LANARKSHIRE COUNCIL
Ealing
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KINGSTON UNIVERSITY
Middlesex University
Utilities
Northern Ireland Electricity
WESTERN POWER DISTRIBUTION
Serving the South West and Wales
ESB
YorkshireWater
Consultancies
Deloitte.
Computacenter
IBM
Service Providers
SUNGARD Availability Services
ACS
Releasing your potential
logica
NaviSite
Xchanging
pasporte
delivering the promise
Industrial/FMCG
VINCI CONSTRUCTION
PREMIER FOODS
Premier Farnell
Parker
SIEMENS
APC
Legendary Reliability
Retail/Other
John Lewis
PLAY.COM
MACKAYS
DIAGEO
Alliance Healthcare
SMYTHS
Menzies DISTRIBUTION
DSGi
DSG international plc
Clarks
UNIPART
pets at home
GALA CORAL GROUP
Bupa
LeasePlan

XIV: Efficiency Everywhere…

- **Yorkshire Water**:

  "The IBM XIV solution ticked all the boxes, & included tight integration with VMware at no extra cost."

- **British Medical Association:**

  "XIV systems provide extremely high performance for business-critical systems even as the volumes rise."

- **Dundee City Council:**

  "XIV mirroring enables us to fail over all our workload from one site to another within about 20 minutes."

- **niu:** *"XIV gave us an immediate three-fold performance increase & as we add capacity, it will get even faster."*

XIV: Efficiency Everywhere…

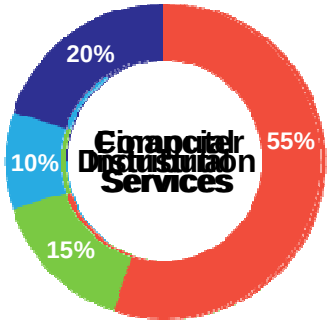
"Mangement so easy, that was the main reason… Hey! That looks sooo easy to use!"

"… remote mirroring environment, flashcopy (Snaphot) … so much more flexible…"

"XIV provides all the performance metrics, & events – no plugins required, that was a big thing for us."

"Something that could give us performance, reliability, something that could be simple to manage, keep the administration hours of the storage systems down to a bare minimum."

XIV and Application Efficiency – Workload-Optimized Storage



"This [illegible] platform [illegible] level of technology and expertise that most customers can't easily develop internally."

Mark Clayman, VP IT

Performance

- Best performance, Under all conditions
- Nothing to tune from XIV or application
- Flexible, scalable and simple

Ease of Use

- Innovative GUIs
- Simplified management
- Rapid time to value

Cost

- Dramatic TCO benefits
- 60%+ TCO Reductions
- Shortest time to ROI

Service Levels

- Broad, deep workload affinity
- Industry expertise
- 100 years of innovation

XIV TCO, Performance and Efficiency in Context

- **60,000** mailboxes tested with high throughput and low latency
- IBM XIV Gen3 used **2TB** SAS drives with **88%** utilization
  - EMC VMAX reported **only 45% utilization** so 2X more disks may be needed to do the same work
  - Hitachi AMS2500 used **450 GB drives** so 4X more disks may be needed to do the same work
  - Reduce power, cooling, and floor space by **up to 50%** with efficient XIV storage

IBM Talking Efficiency – XIV … An example…

IBM XIV storage costs up to **69%** less to own and operate than EMC VMAX, while delivering better performance*

* “Cost/Benefit Case for IBM XIV Systems: Comparing Cost Structures for IBM XIV and EMC V-Max Systems”, International Technology Group Santa Cruz, California, July 2011

Thank you