



Technical Forum & Executive Briefing

17 al 21
Octubre
2011

Imagine **PODER** Imagine **CAPACIDAD**

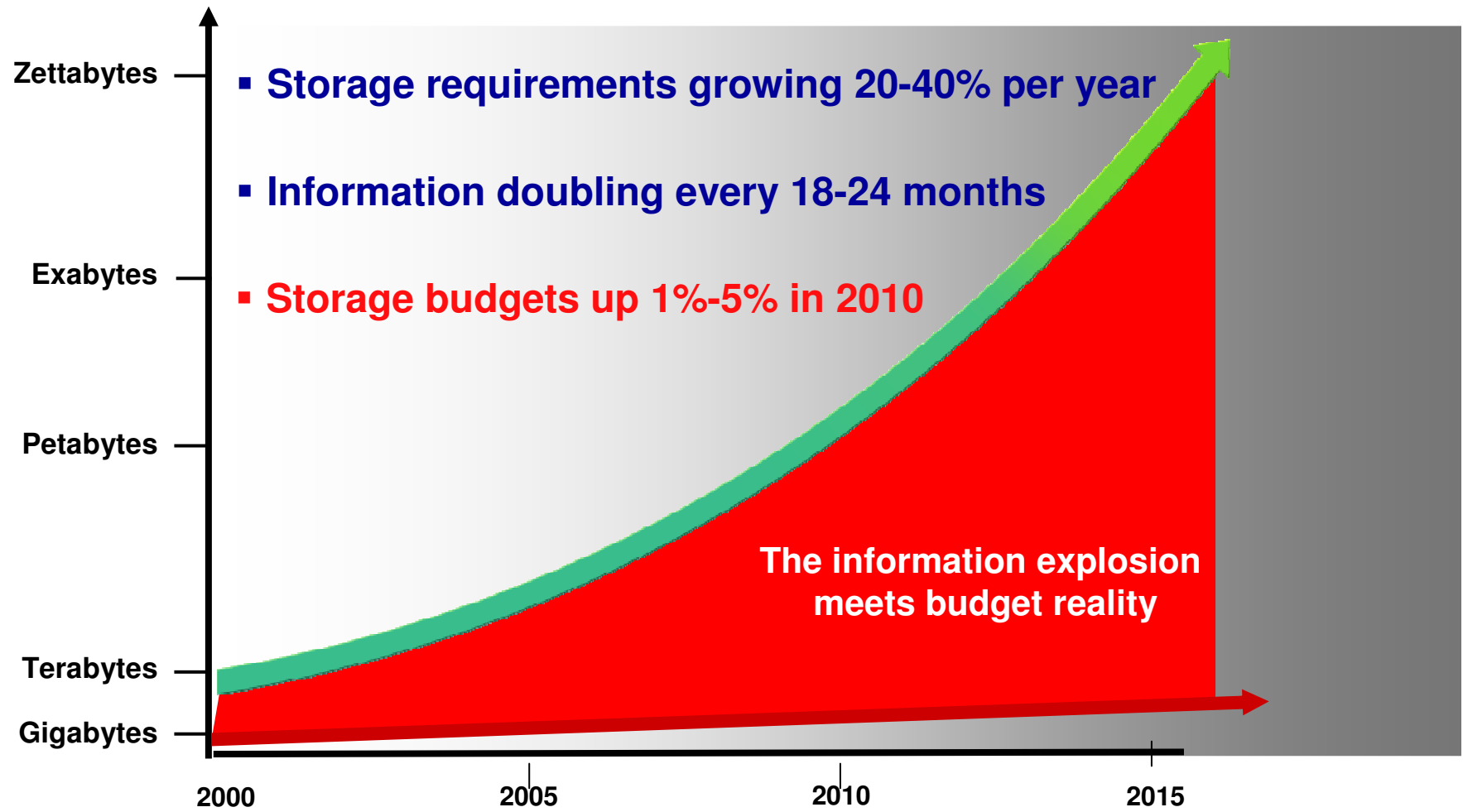
Juan Felipe Cura Vazquez

LA Tape/Robotics & ProtecTIER Brand Manager

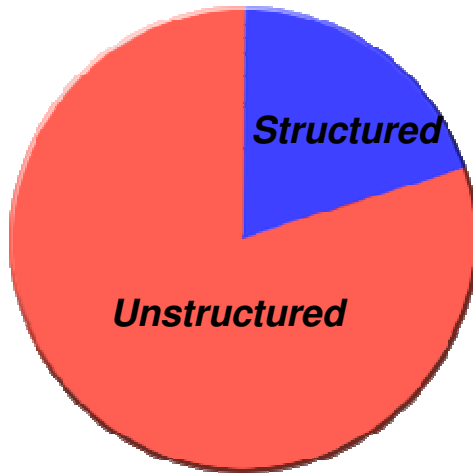
October 2011



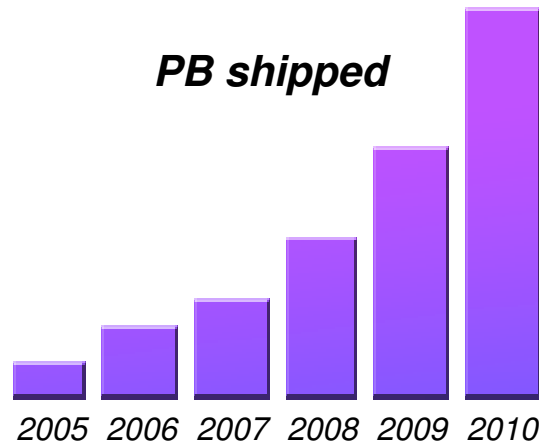
Smarter systems are creating an information explosion



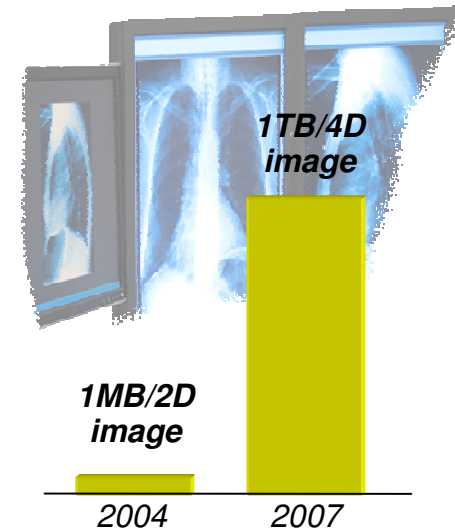
Data growth drives the need for data center Transformation



Up to 80% of data is unstructured content (email, video, images)



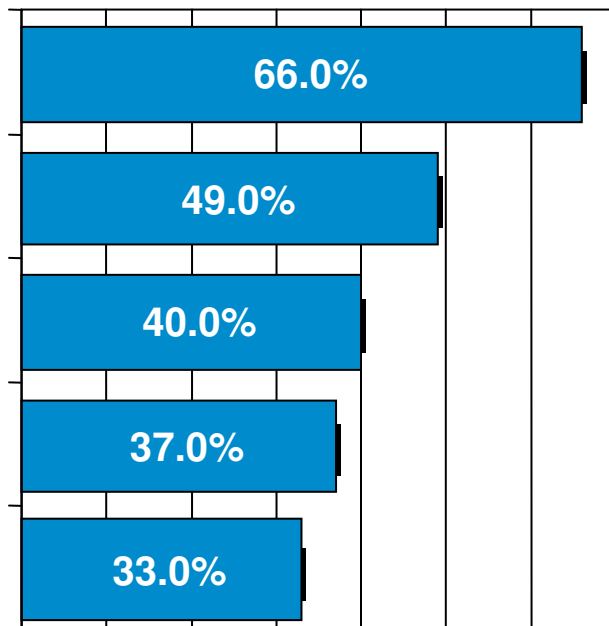
Storage capacity shipments are growing at 54% a year



Example: Medical images will take up 30% of the world's storage

Backup administrators are struggling to keep up with rapid data growth

What are the biggest problems with your current backup and recovery Solutions?



Backups take too long

Recoveries take too long

Manual effort required

Difficulty measuring backup success

Media management



Symptoms of Struggling...

Applications are slow

Operational costs are increasing

Legal costs are soaring

Backups seem to take forever

Batch jobs run into working hours

Upgrading has become cost-prohibitive

SLAs are being missed



63% of IT executives rate compliance with regulations a top challenge

Compliance

*The average legal discovery request can cost an organization from **\$150K to \$250K***

Performance

Cost

*Downtime costs can eat up to **16%** of revenue in some industries*

Availability

Risk



Why backup data?





ACCIDENTAL

- Natural Disaster
- System Error
- Operation Error

INTENTIONAL

- Virus
- Theft
- Hacker
- Sabotage
- Disgruntled employee

March 2011: Japan is Devastated



Why backup data?

Backups are created for restoring data for any kind of failures

- ▶ **Disaster**
- ▶ **Hardware outages**
- ▶ **Human errors**

- ▶ **Application errors**

- ▶ **For keeping different versions**



Using the right balance of high density tape and high performance Disk is the solution



- **Long Term Retention**
 - Cost effective capacity
 - Removable & transportable
- **Compliance**
 - Meet financial & regulatory requirements
 - Data encryption, WORM

- **Short Term Retention**
 - Use disk for daily backup & restore operations
- **Performance**
 - Fast backups
 - Even faster restores
 - Meet “backup windows”

LTO Technology Roadmap



Eight-Generation Roadmap



	Generation 1	Generation 2	Generation 3	Generation 4	Generation 5	Generation 6	Generation 7	Generation 8
Compressed Capacity	200 GB	400 GB	800 GB	1.6 TB	3 TB	8 TB	16 TB	32 TB
Native Capacity	100 GB	200 GB	400 GB	800 GB	1.5 TB	3.2 TB	6.4 TB	12.8 TB
Compressed Data Rate	up to 40 MB/s	up to 80 MB/s	up to 160 MB/s	up to 240 MB/s	up to 280 MB/s	up to 525 MB/s	up to 788 MB/s	up to 1180 MB/s
Native Data Rate	up to 20 MB/s	up to 40 MB/s	up to 80 MB/s	up to 120 MB/s	up to 140 MB/s	up to 210 MB/s	up to 315 MB/s	up to 472 MB/s

Note: Compressed capacities for generations 1-5 assume 2:1 compression. Compressed capacities for generations 6-8 assume 2.5:1 compression (achieved with larger compression history buffer).

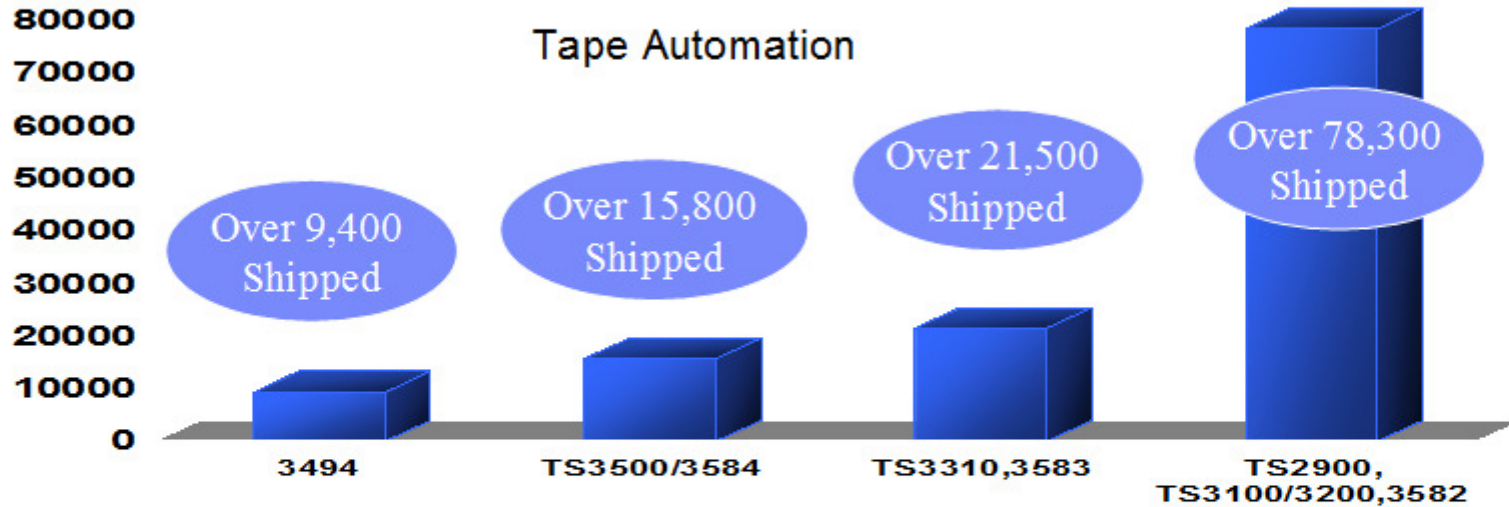
Source: The LTO Program. The LTO Ultrium roadmap is subject to change without notice and represents goals and objectives only.

Linear Tape-Open, LTO, the LTO logo, Ultrium, and the Ultrium logo are registered trademarks of HP, IBM and Quantum in the US and other countries.

Marketplace Milestones

IBM tape program shipment estimates

Over 125,000 IBM Automation Footprints



LTO Drives

Over 1,425,000 Shipped

Featuring IBM LTO-5 and Linear Tape File System (LTFS)

Enterprise Drives

Over 96,100 Shipped

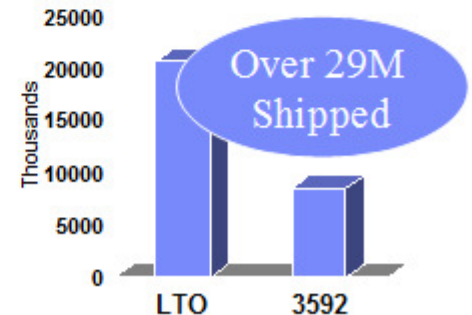
Featuring IBM TS1130 1TB Drive

Tape Virtualization Solutions

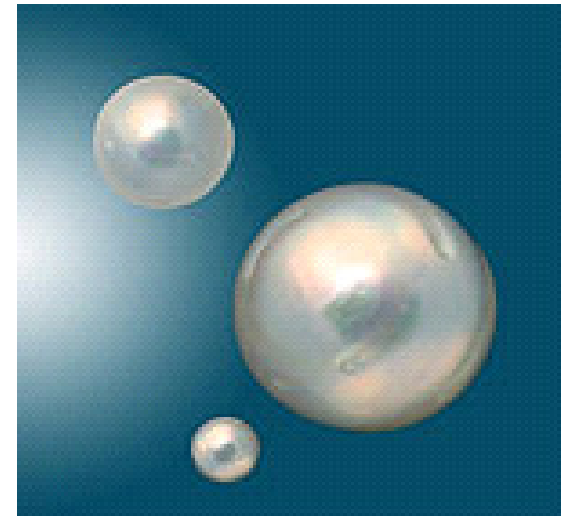
Over 9,300 Virtual Tape Systems Shipped

Led by TS7700 and TS7600 Virtual Tape Systems

IBM Logo Media



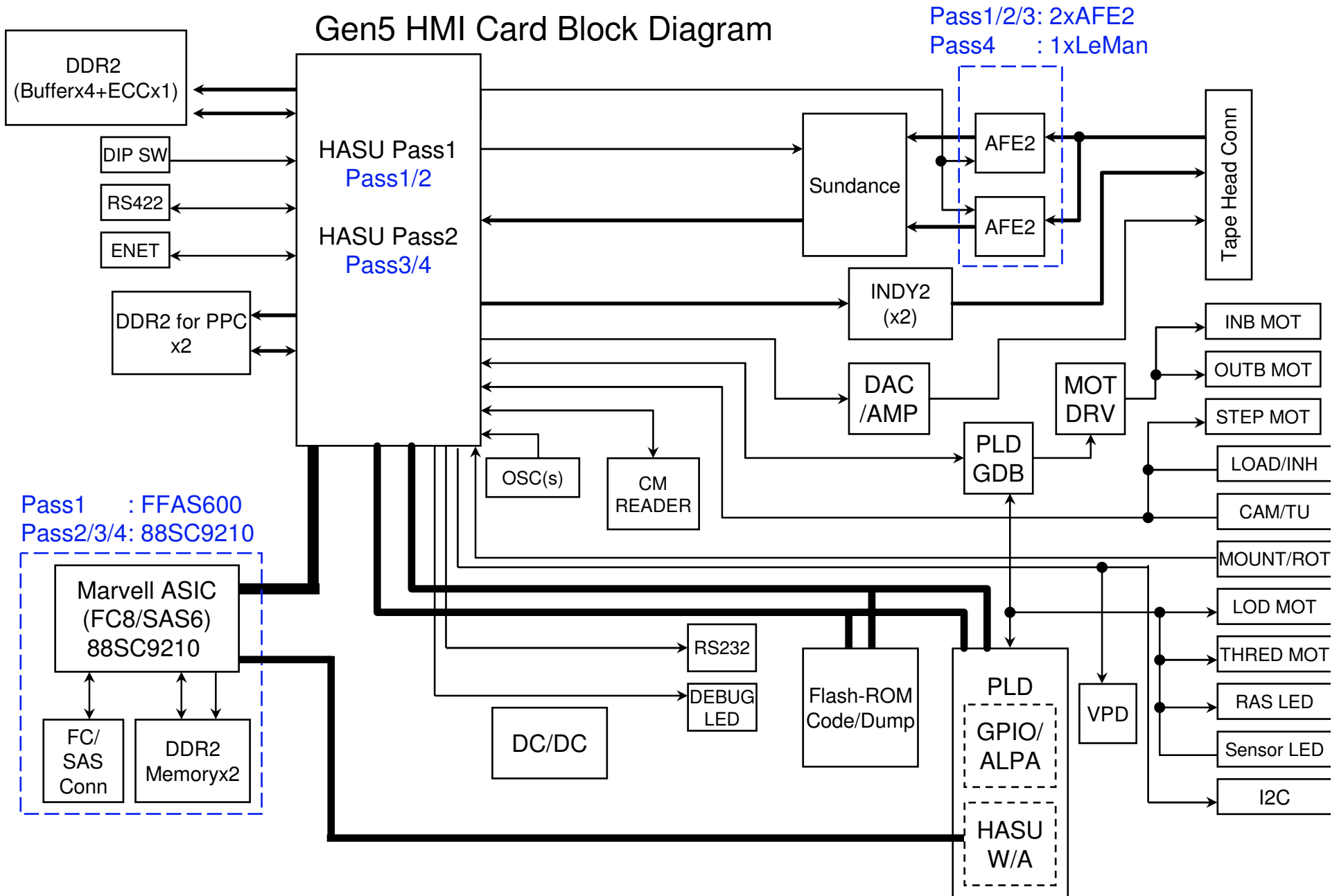
IBM LTO Generation 5



IBM LTO Generation 5

A simple vision of the LTO5

Gen5 HMI Card Block Diagram



NOTE: Card size is the real FH form factor.

Linear Tape File System

Allows access of data on LTO-5 tape in a manner like a 4TB memory stick!



A File System for Tape!

- ▶ Manage files easily with directory tree access; drag and drop capability
- ▶ Uses LTO-5 dual partition capability to store the index and the content

Self Describing Tape

- ▶ No application software dependencies; Ideal for controlling costs and long term archive
- ▶ Allows cross platform sharing of files and video content

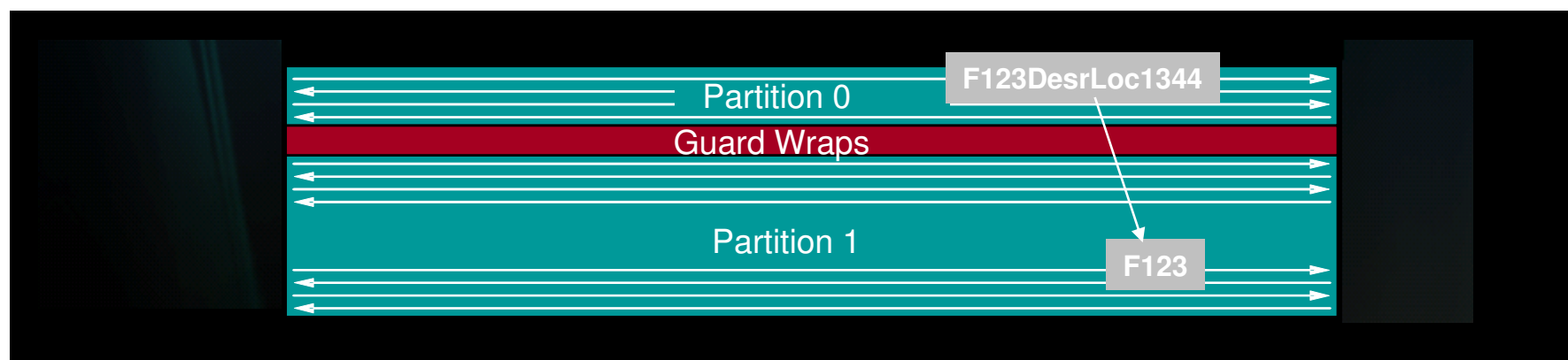
Created by IBM Research

- ▶ Offered by IBM as 'open standard' to LTO Technology Providers
- ▶ IBM offers stand drive freeware for versions of Windows, MAC OS, Linux
- ▶ IBM offers LTFS Library Edition for its family of automated tape libraries
- ▶ Learn more at <http://www-03.ibm.com/systems/storage/tape/ltfs/index.html>

Linear Tape File System (LTFS)

What is it - How does it work?

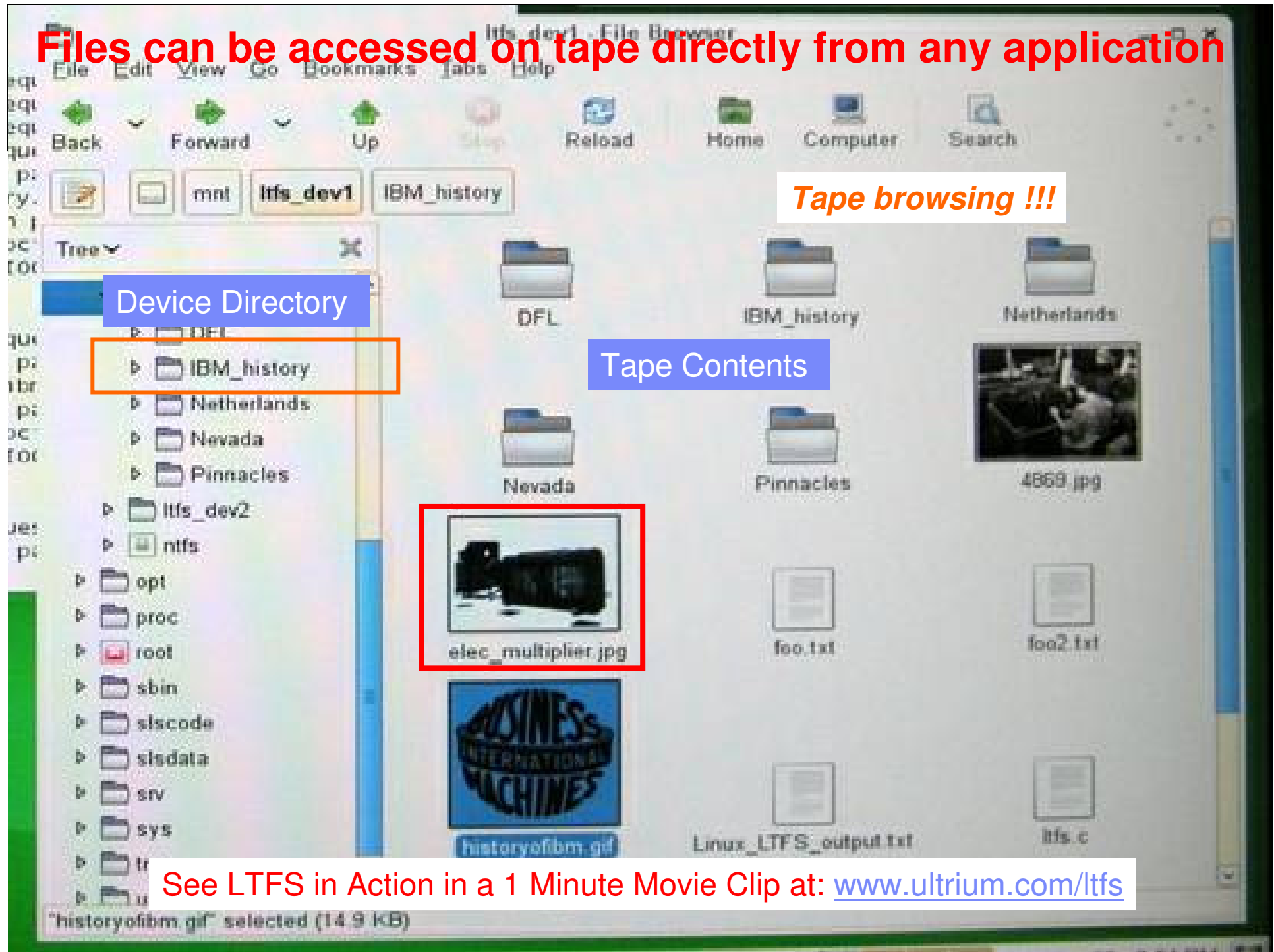
- ▶ Tape drive freeware that is downloaded on to Linux, MAC, Windows
- ▶ Utilizes the dual-partitioning capability
- ▶ Index partition and content partition: Mount a tape as if it was a hard drive
- ▶ Creates a self describing tape; view contents in the OS browser; drag and drop!
- ▶ No additional backup applications needed; can share tapes across platforms
- ▶ You can think of it as a giant 4 TB uncompressed memory stick



Potential Applications:

- Video workflow, individual scene access and video asset archive
- Digital video surveillance (squad car, parks, garages, etc.)
- Design and drawing content for manufacturing, architecture, construction
- Medical / Health imaging; Legal documents-evidence; Cloud apps...and more!

Files can be accessed on tape directly from any application



Tape browsing !!!

Device Directory

Tape Contents

See LTFS in Action in a 1 Minute Movie Clip at: www.ultrium.com/ltfs

Media & Entertainment Industry



Key Requirements

- ▶ Very large archives and long term archive requirements: 50-100 years
- ▶ Film/video tape should be self-contained open tape format
 - ▶ *Files stored in application-independent fashion*
 - ▶ *Ability to distribute and interchange files on tape*
 - ▶ *Files readable from information stored to tape without requiring application's DB*
 - ▶ *Ability to recover from corruption or loss of application's DB*
- ▶ Lower cost than current methods: *LTO tape can address*

LTO-5 Partitioning and IBM Long Term File System Potential Business Value:

- ▶ Can reduce cost of video storage media and equipment
- ▶ Supports file-based workflow, increases data mobility and can unify across organizations to a single storage media for video formats
- ▶ Can reduce data ingest time
- ▶ Can reduce archive storage space by 10x (compared to video-tape)
- ▶ Supports green initiatives: can reduce energy consumption by up to 100x (compared to HDD)

Data Deduplication is a “HOT” technology



Organizations are deploying deduplication to address the backup issues they are facing



- 61% need to reduce backup times
- 61% cost of backup and recovery infrastructure
- 56% keeping pace with capacity of data growth

THE INFO PRO



- Deduplication is Number 1 on “Heat Index”
- 24% using deduplication now
- 16% plan to implement in near term
- 28% plan to implement in long term



- Deduplication is becoming mainstream
- Total terabytes anticipated to increase at a 29.2% CAGR
- 65% of the total amount of terabytes being used backup will be using data deduplication by 2012

for

Data deduplication

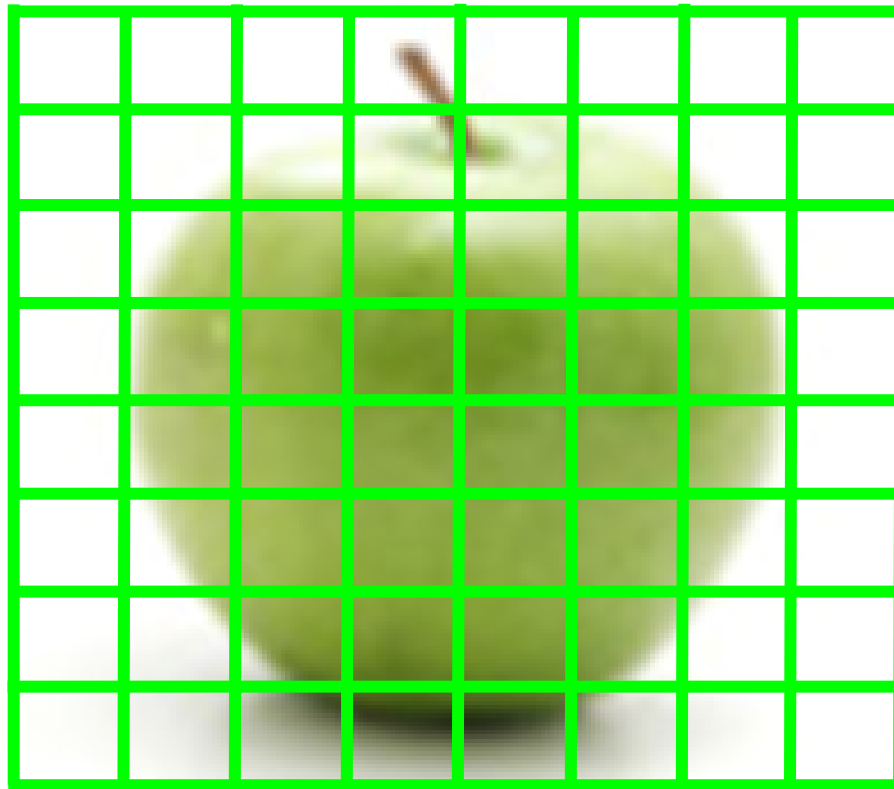
Dedup



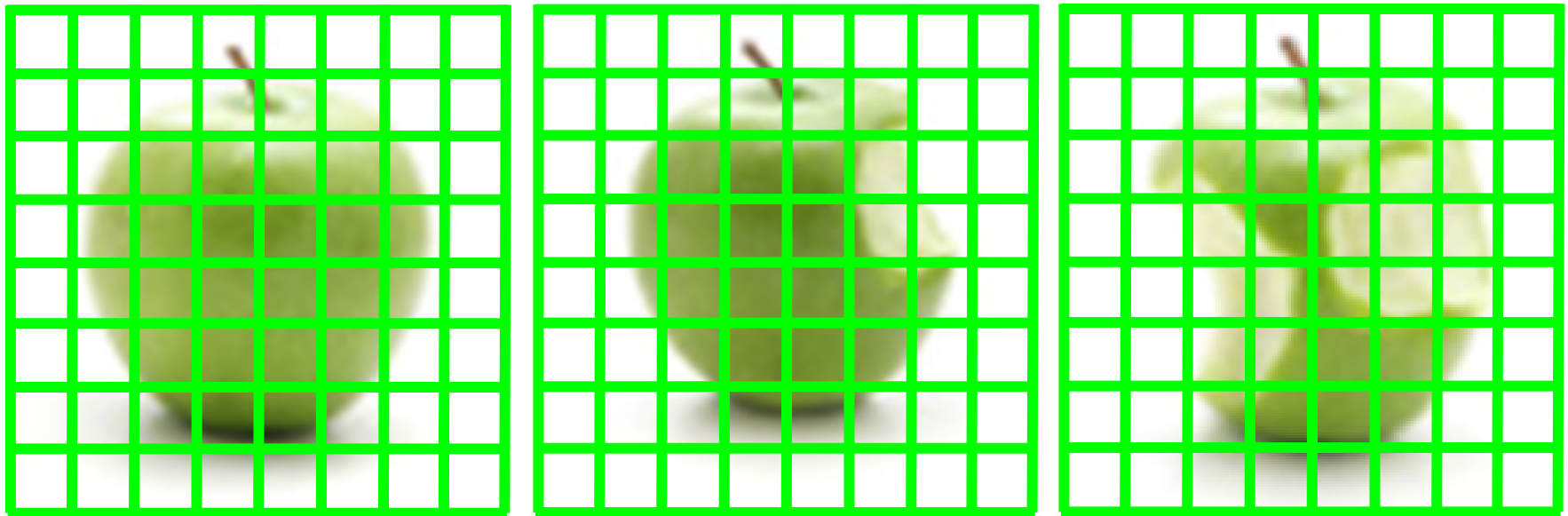
Ejemplo de DDD



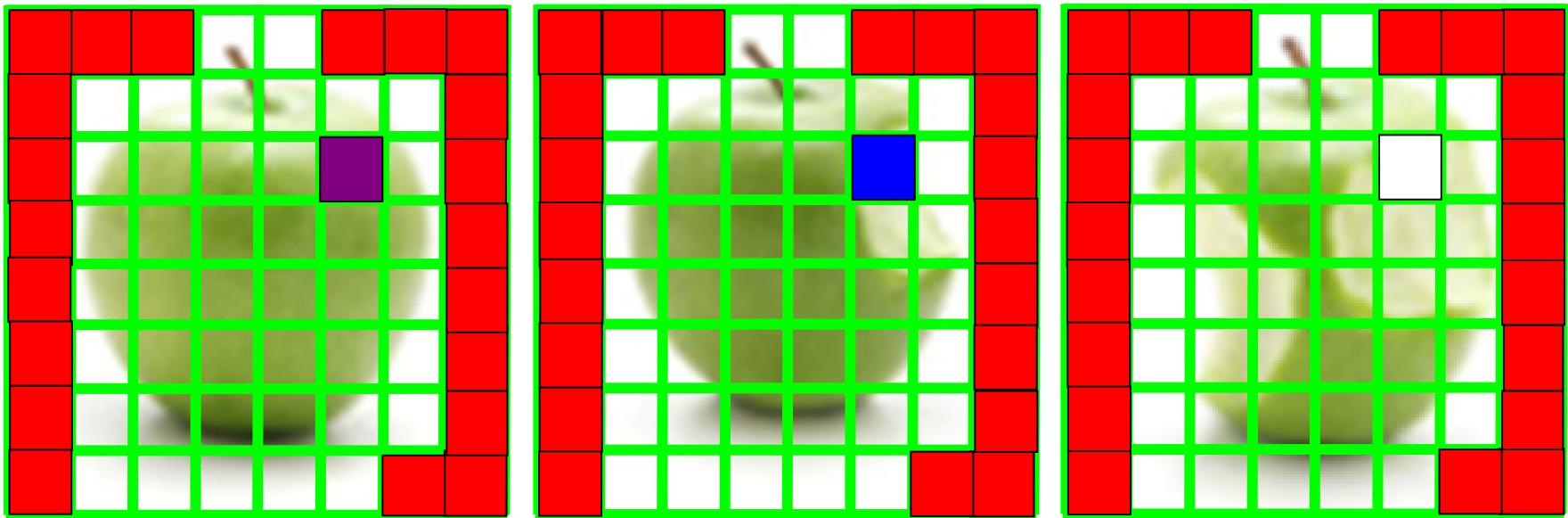
Ejemplo de DDD



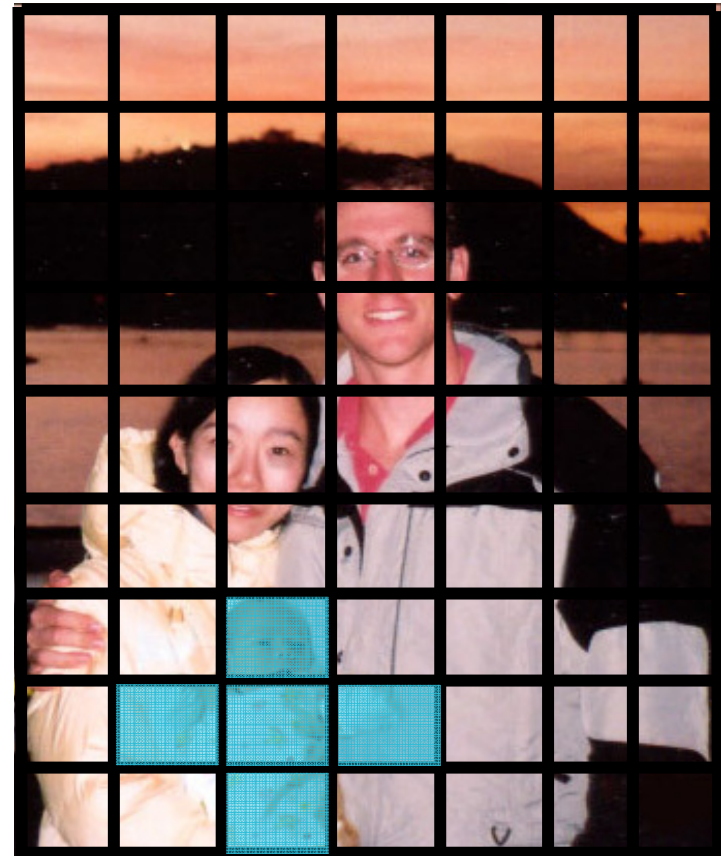
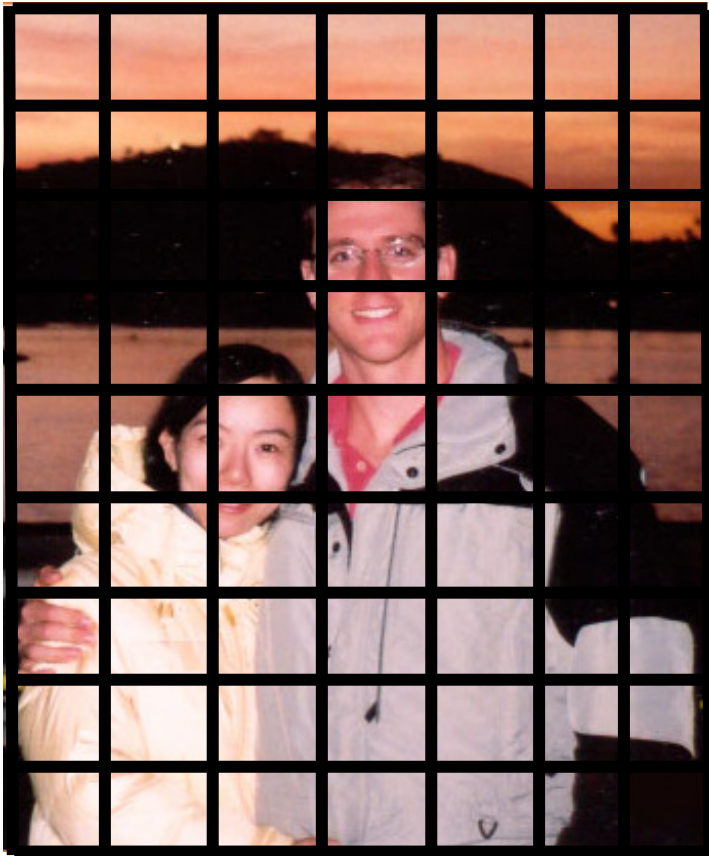
Ejemplo de DDD



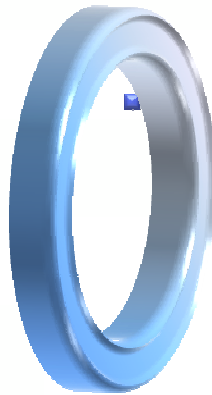
Ejemplo de DDD



Nuevo ejemplo de Respaldo incremental Classico !



ProtecTIER Data Deduplication



Arquitectura

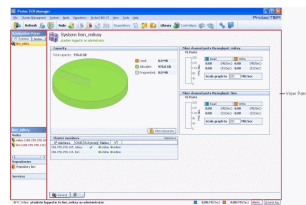
De los

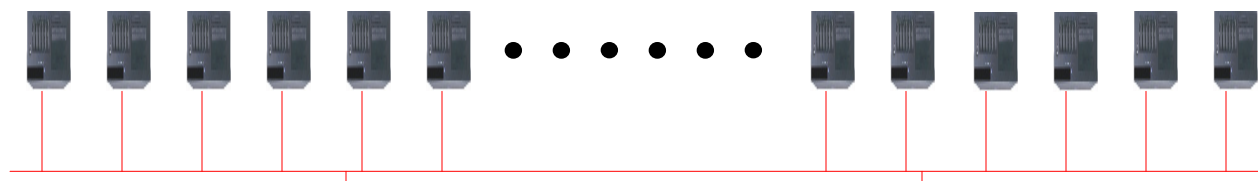
VTL's



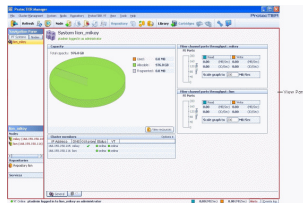
Gateway

Appliance





ProtecTier



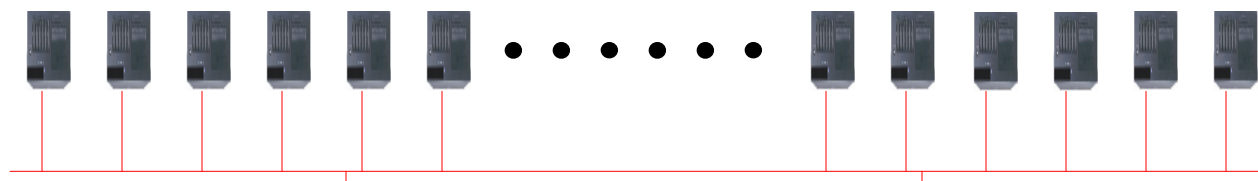
Gateway



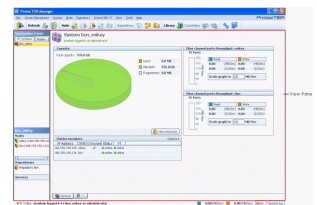
Appliance



**Four Intel
Eight Processor (2,26GHz)
32 Total Processors
64 GB Total memory.**



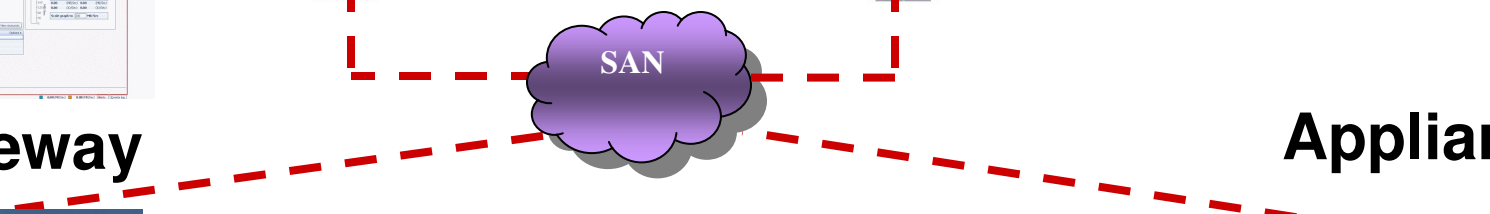
ProtecTier



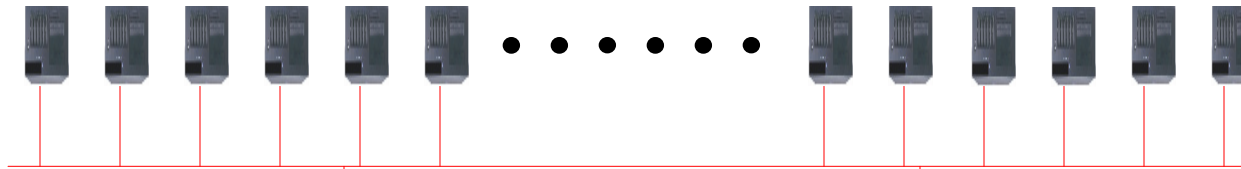
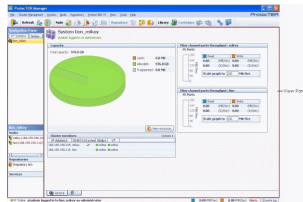
Gateway

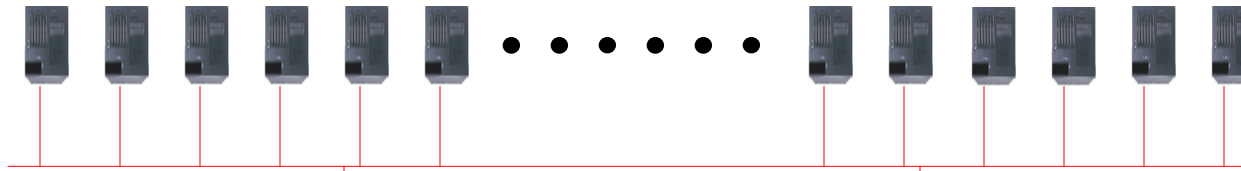


Appliance

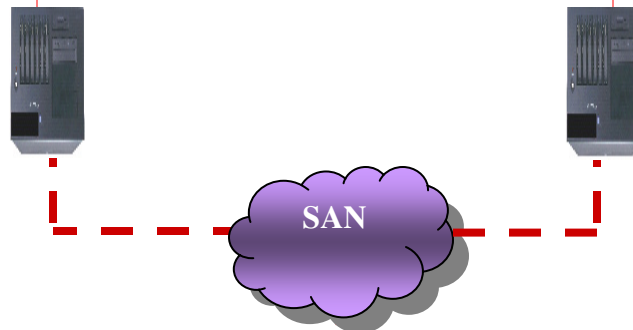
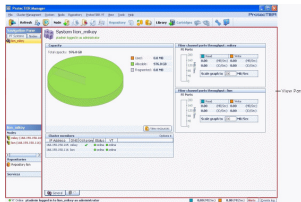


ProtecTier





ProtecTier



16 Librerías TS3500
512 Direcciones LTO
+ 500.000 Cartuchos

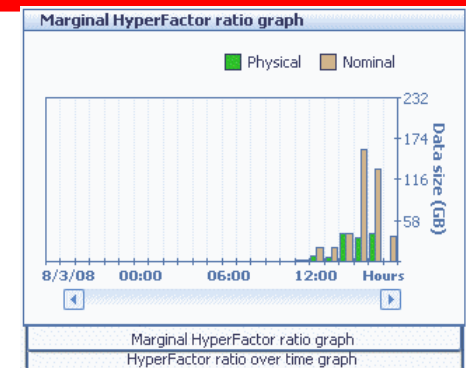
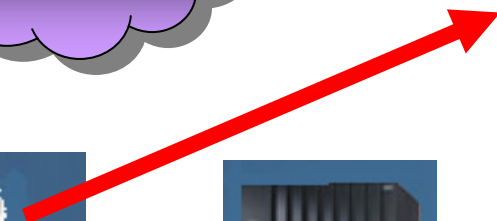


Beneficios del VTL

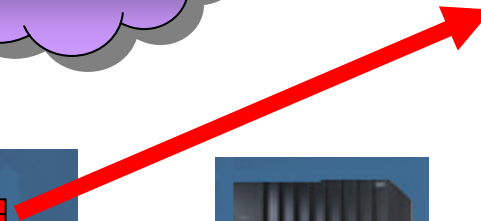
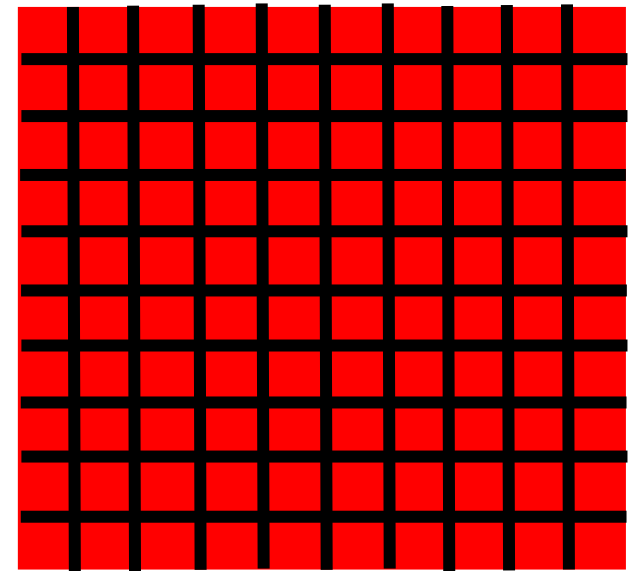
- Paralelismo de las operaciones en Cinta.***
- Acceso directo a la información.***
- Ocupa menos espacio que Cientos de Tape Drives y Cintas.***
- Replicación mas fácil entre los VTL.***
- Recuperación rápida de los Datos.***
- Transmisión rápida entre los canales.***
- Leer y Gravar en los volúmenes sin esperar el montaje físico.***

Estructura de análisis de las informaciones con DDD

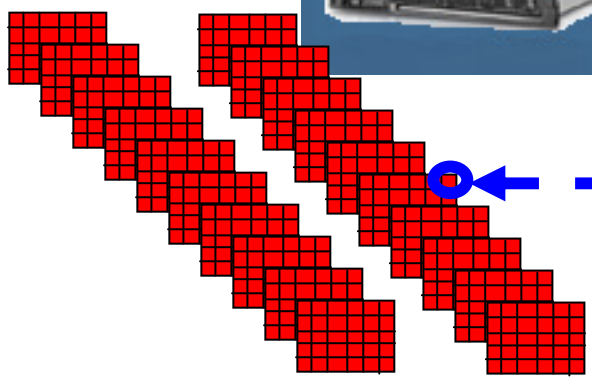
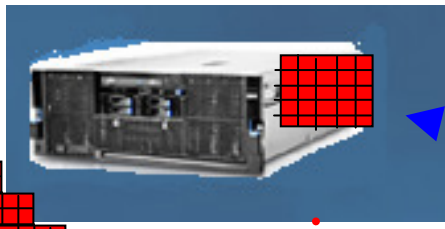
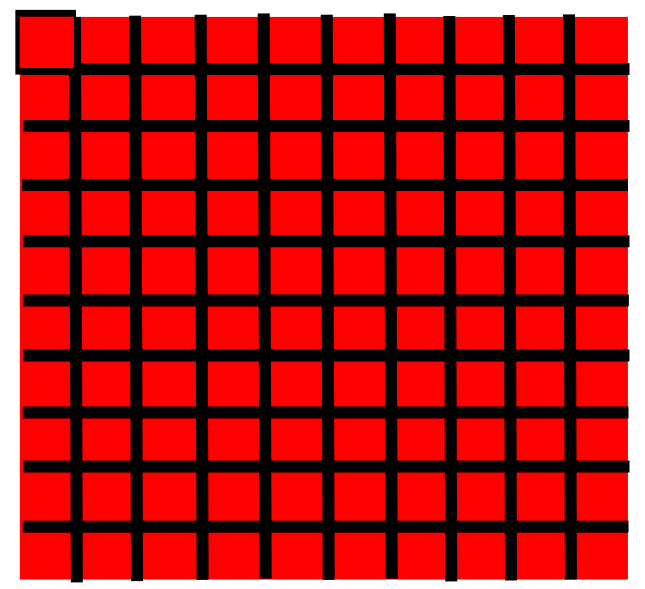
Visión física de la Solución



Visión física de la Solución



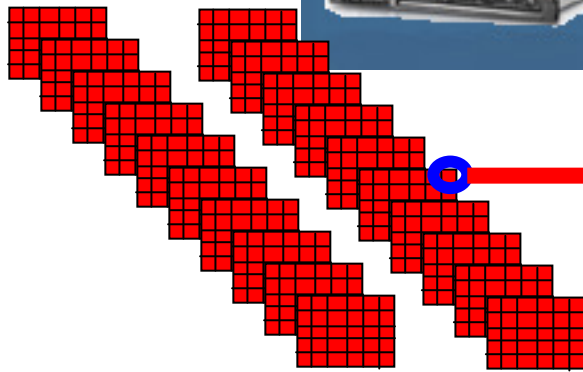
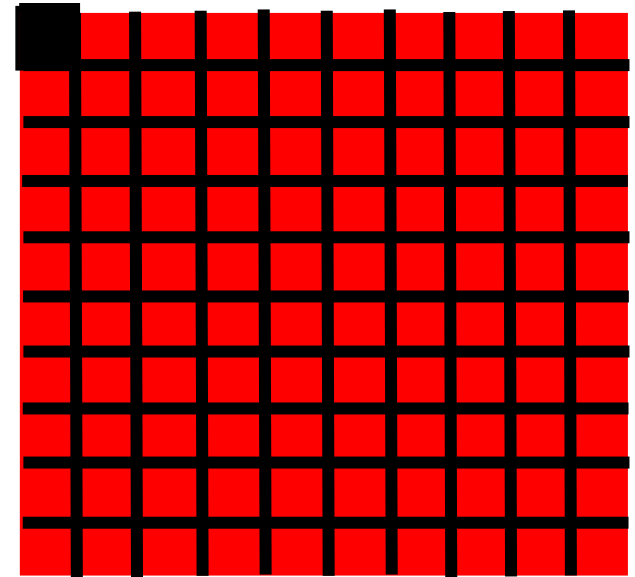
Visión física de la Solución



Iguals!



Visión física de la Solución



Iguals o quizá no!



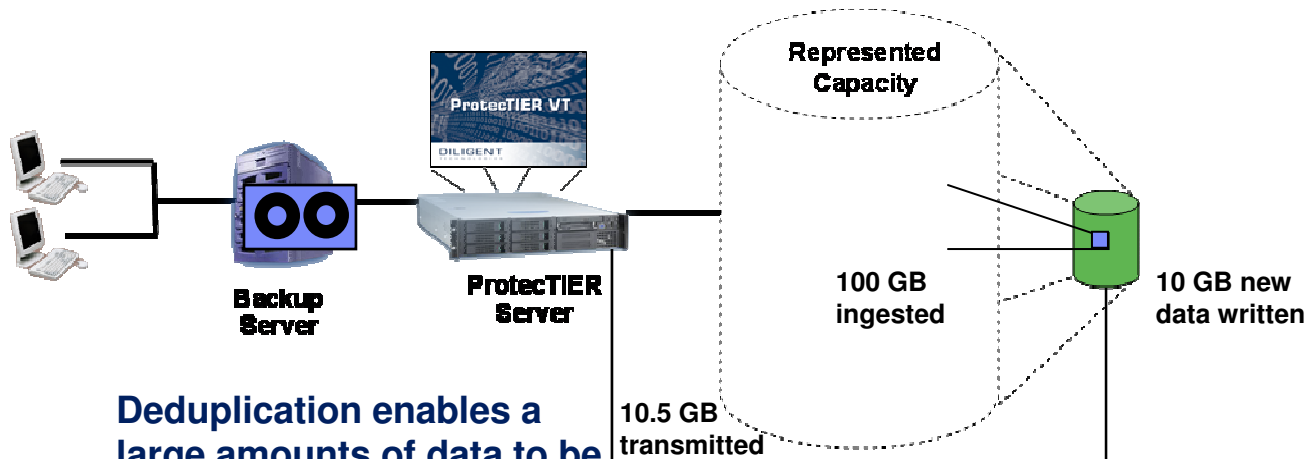


Replicacion con IBM ProtecTIER

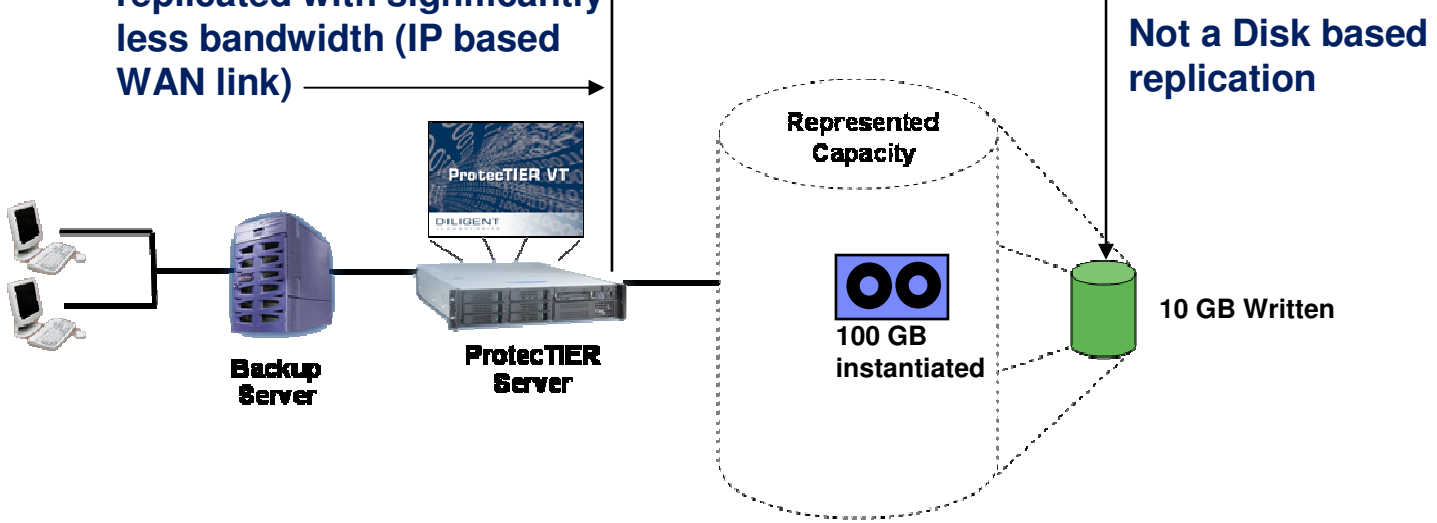


Significantly Reduces Replication Bandwidth^{DDD}

Primary Site

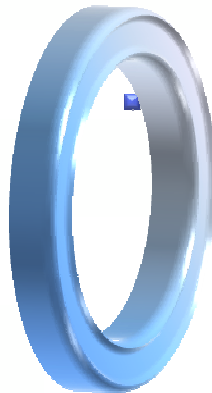


Secondary Site





Beneficios de la Deduplicación





Beneficios de la Deduplicación

- ***Poder gravar mas que la capacidad del disco.***
- ***Ahorro de espacio.***
- ***Ahorro de energía.***
- ***Ahorro del aire acondicionado.***
- ***Mas versiones de respaldo con acceso directo.***
- ***Facilidad de replicación.***
- ***Ahorro en la transmisión de datos entre los VTL's.***

Por que Utilizar las soluciones de Data Deduplication de IBM?



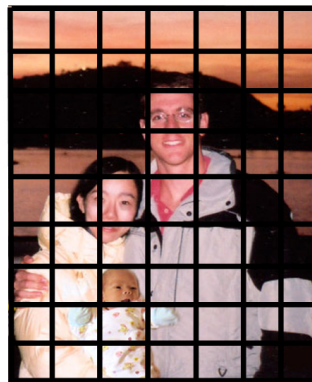
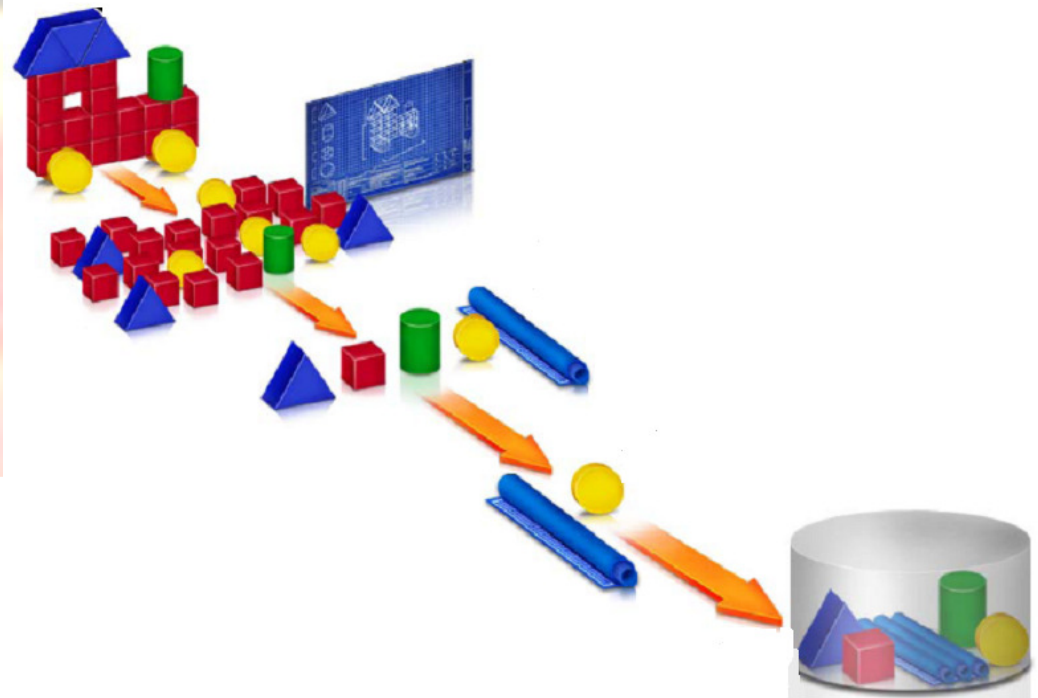
Por que Utilizar las soluciones de Data Deduplication de IBM?



2000MB/s (On a cluster), inline in real customer environment

Technical Enablers

- 4 GB Memory based index eliminates a key potential bottleneck
- “Similarity search” process enables optimal IO utilization



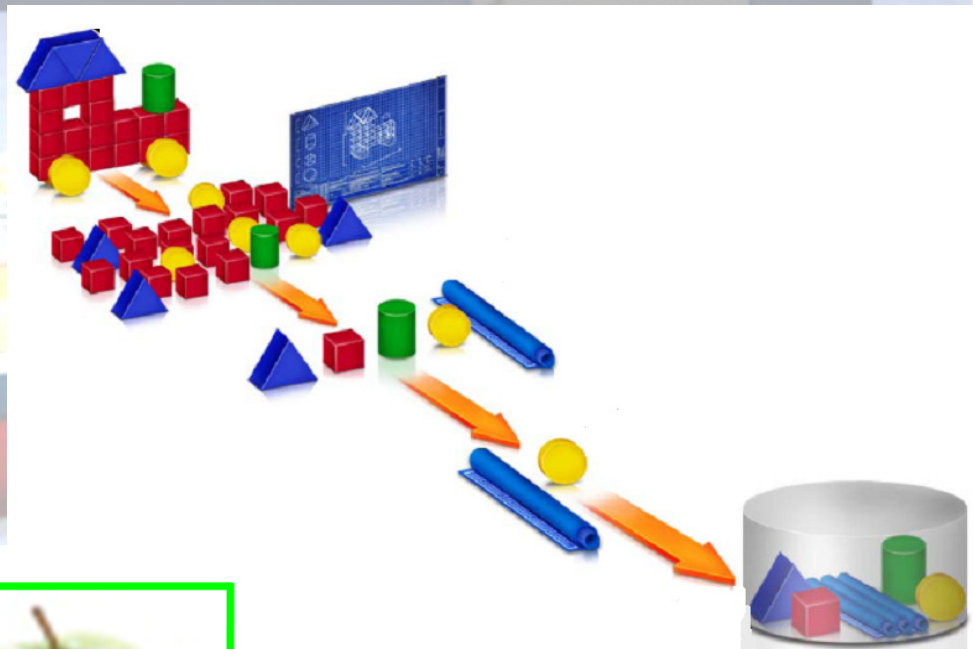
Por que Utilizar las soluciones de Data Deduplication de IBM?



Up to 1 PB physical capacity per node

Technical Enablers

- **Efficient index can map a full PB with only 4 GB of RAM**
- Open architecture is designed to scale
- Capacity can be added to existing repositories easily



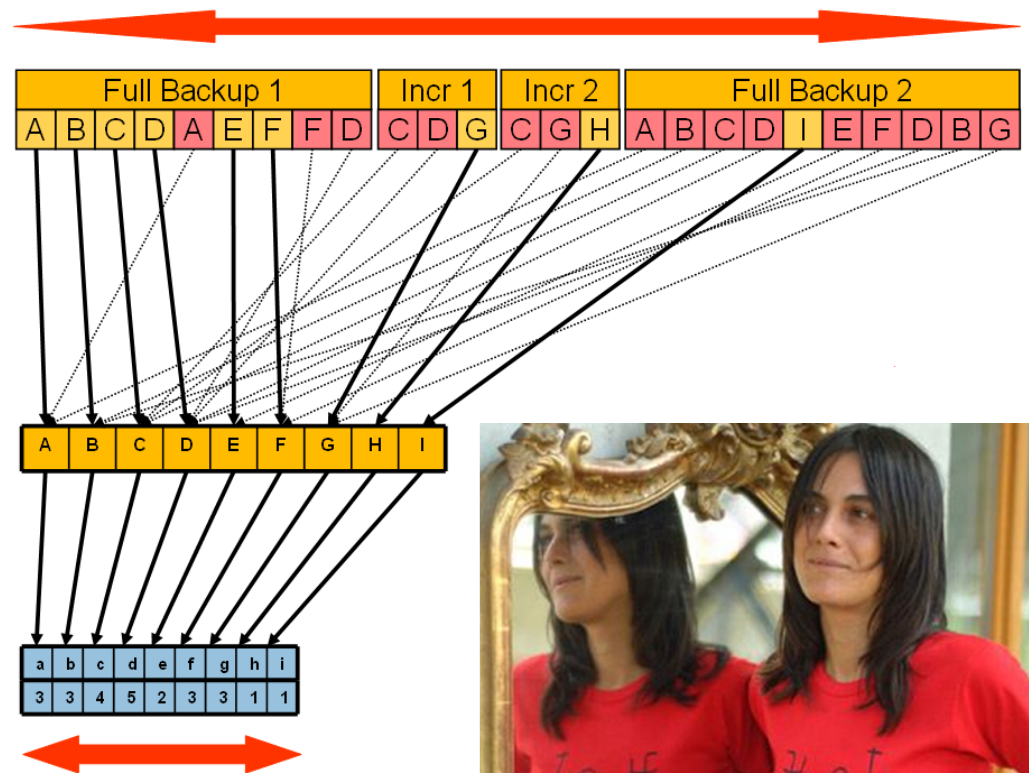
Por que Utilizar las soluciones de Data Deduplication de IBM?



IBM de-dupe process ensures 100% data integrity

Technical Enablers

- De-dupe process includes a binary diff, such that redundant data is eliminated only after a byte-by-byte check has been



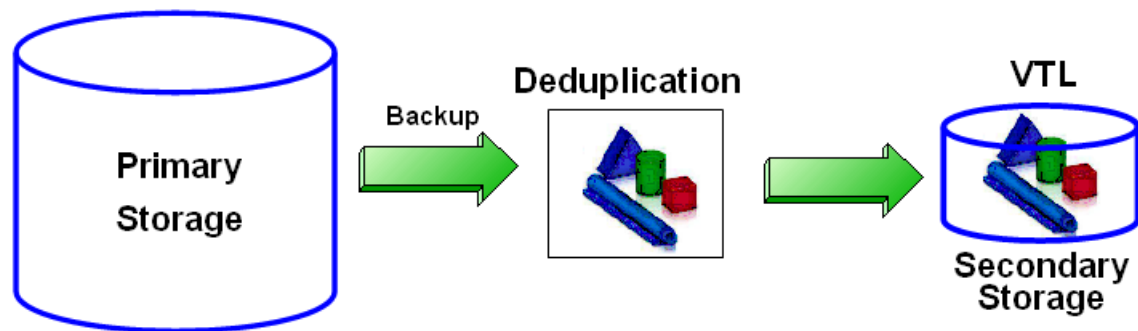
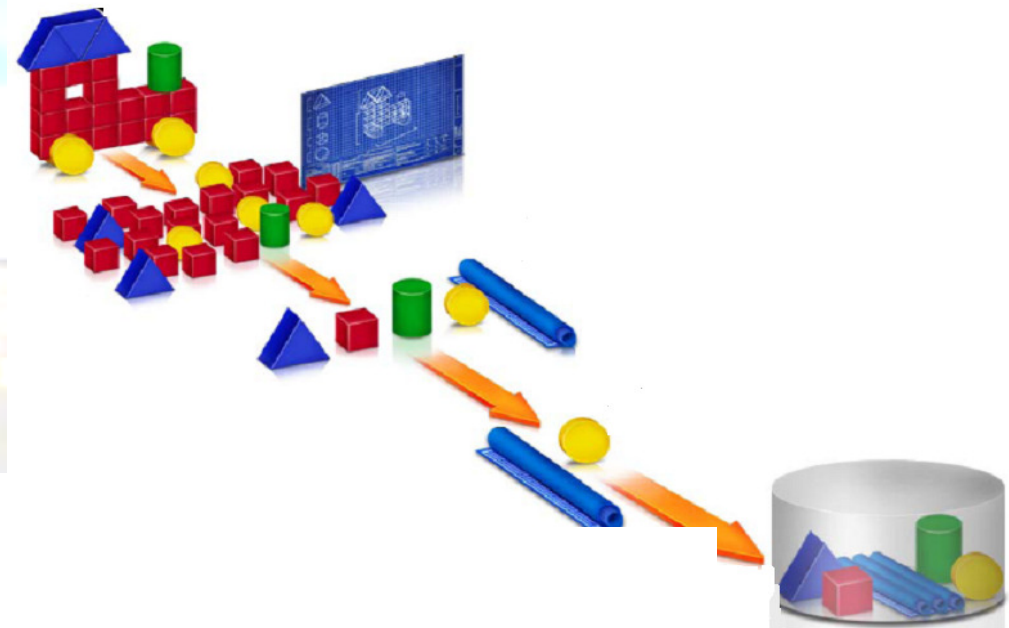
Por que Utilizar las soluciones de Data Deduplication de IBM?



Inline de-dupe ensures that existing data protection operations are not negatively impacted

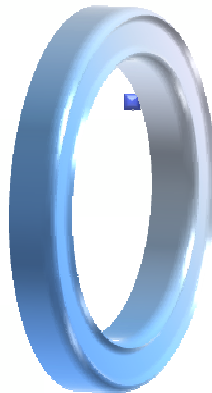
Technical Enablers

- **Inline de-dupe means that de-dupe is done when the ingest is complete**
- **Important tasks such as cloning to tape for offsite DR may begin immediately following ingest**





Soluciones IBM para Deduplicación.





IBM TS7600 ProtecTIER® De-duplication Family

ProtecTIER Software Features

- ▶ IBM TS3500 Tape Library Emulation
- ▶ LUN Masking
- ▶ OpenStorage
- ▶ HyperFactor™ Data De-duplication
- ▶ Many to one Native Replication
- ▶ True active-active Cluster Support

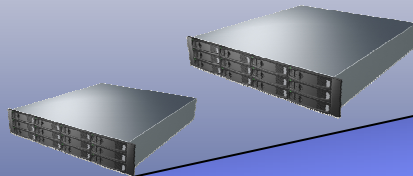
TS7650 Appliances

TS7650G Gateways



TS7610 Entry Appliances

Good Performance
Lowest Cost



Up to 80 MB/sec
4.0 TB useable

Good Performance
Highly Scalable
Low cost



Up to 80 MB/sec
5.4 TB useable

Better Performance
Larger Capacity
Scalable



Up to 100 MB/sec
7 TB useable

Up to 250 MB/sec
18 TB useable

Highest Performance
Largest Capacity



Up to 500 MB/sec
36 TB useable

Highest Performance
Largest Capacity
High Availability



Active-Active Cluster
Up to 500 MB/sec
36 TB useable

High Performance
High Capacity
Flexible Storage



Single Node
Up to 500 MB/sec
1 PB useable

Highest Performance
largest Capacity
High Availability

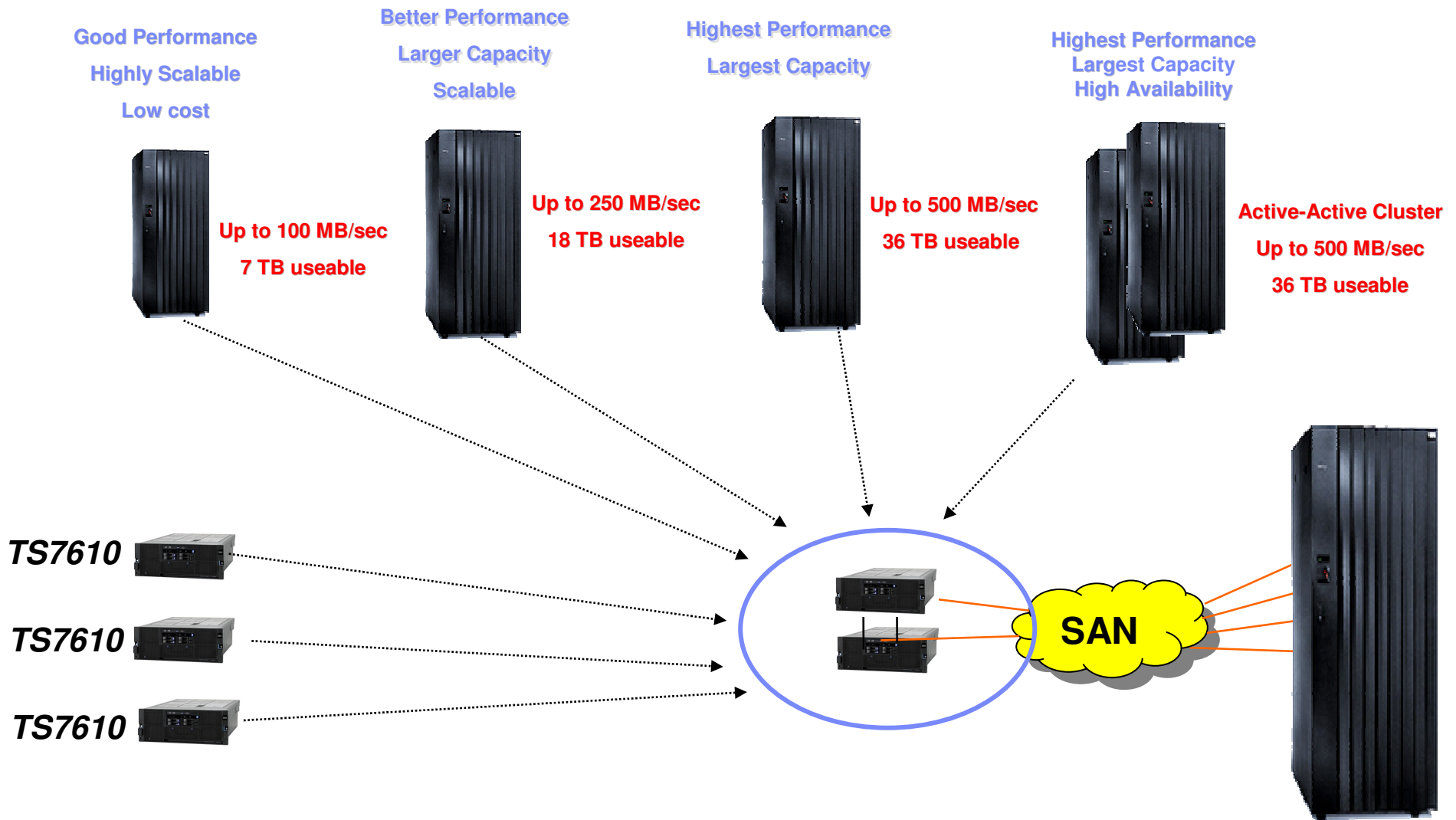


Active-Active Cluster
Up to 1000 MB/sec
1 PB useable

Scalable Capacity and Performance

ProtecTIER™

Replicating many to one



Replicating many to one



ProtecTIER™

Good Performance
Highly Scalable
Low cost



Up to 250 MB/sec
18 TB useable

Better



Up to 250 MB/sec
18 TB useable

Highest Performance
Largest Capacity



Up to 500 MB/sec
36 TB useable



Active-Active Cluster
Up to 500 MB/sec
36 TB useable

Best Performance
Largest Capacity

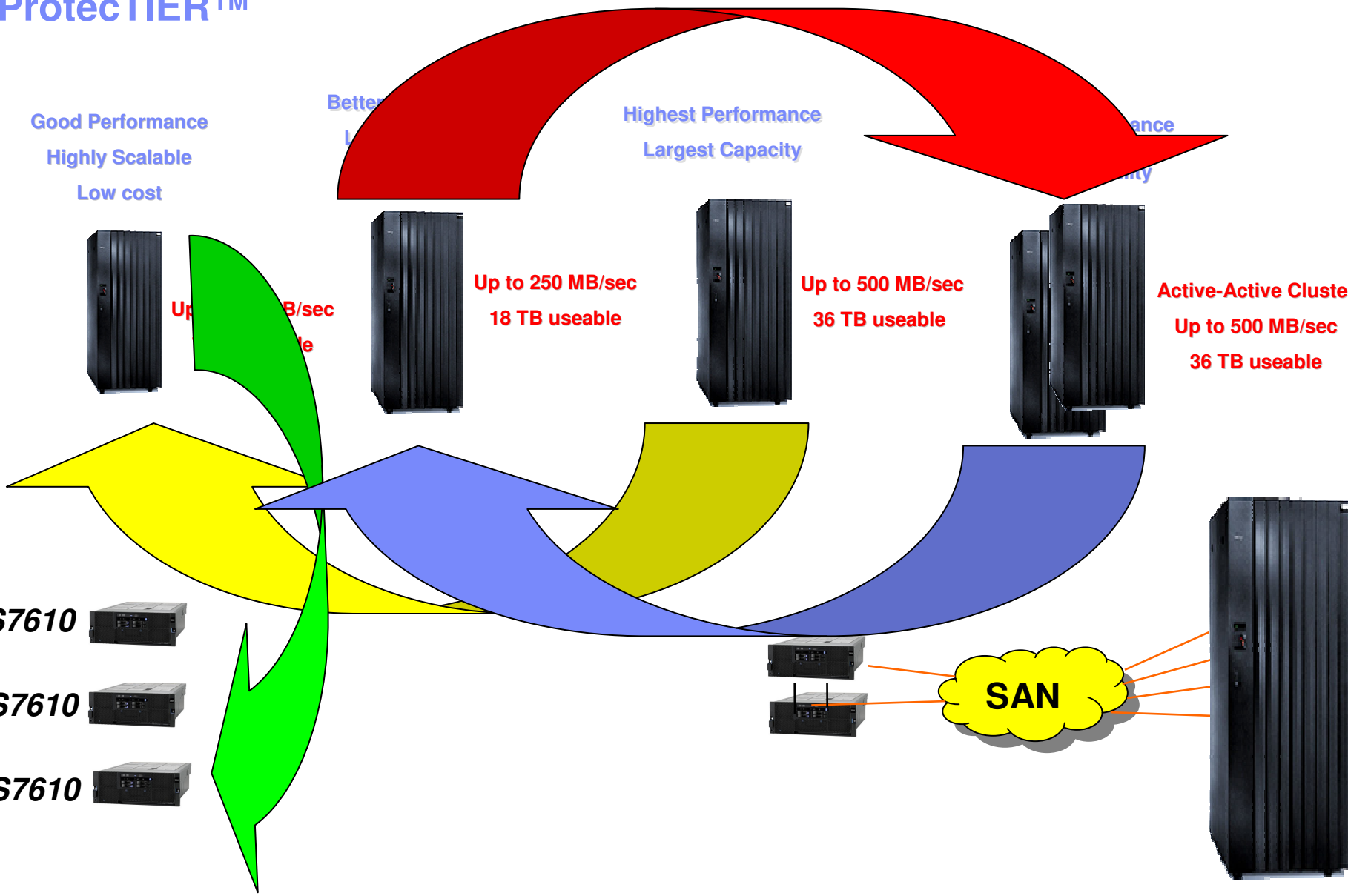
TS7610



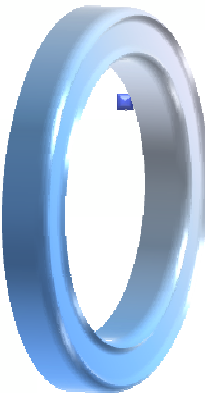
TS7610



TS7610



ProtecTIER Performance



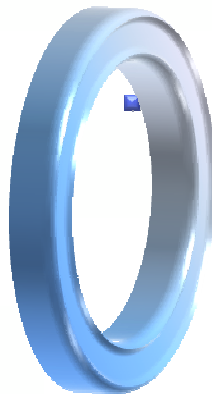
ProtecTIER Performance

High-speed backups: Up to 2000 MB/sec or more (7.2 TB/hr) sustained inline deduplication backup performance

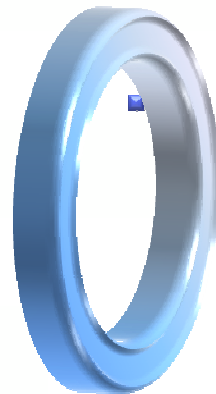
Even faster restores: Up to 2800 MB/sec or more (10 TB/hr) sustained recovery performance

Data Integrity: Nonhash-based approach avoids the possibility of data loss due to a hash collision

Production proven: Tested and proven in thousands of production environments around the globe since 2005



Que dice Gartner Group de la solución IBM?



Que dice Gartner Group de la solución IBM?



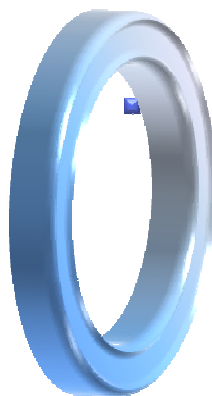
Gartner believes that there are several positive attributes offered by ProtecTIER that often resonate with end user requirements. These include:

1. The large scale, production-proven track record of the HyperFactor deduplication technology
2. Gartner has confirmed is deployed in environments of over 1 PB of physical disk and protecting well over 20 PB of data.
3. The number of large enterprise deployments, which typically have over 35 TB of physical storage deployed in a solution.
4. The ability to deploy the solution in a gateway configuration that allows for the usage of a variety of disk solutions of varying capacity, performance and cost – as well as expandability.
5. This gateway option also allows an organization to grow without necessarily having to add additional appliances.
6. Solid performance:
 - Fast inline deduplication data ingestion
 - Fast restore performance
 - Performance statistics that do not appear to degrade as capacity increases

Yours sincerely,

Dave Russell
Vice President, Storage Technologies and Strategies

Gartner Client Service Group



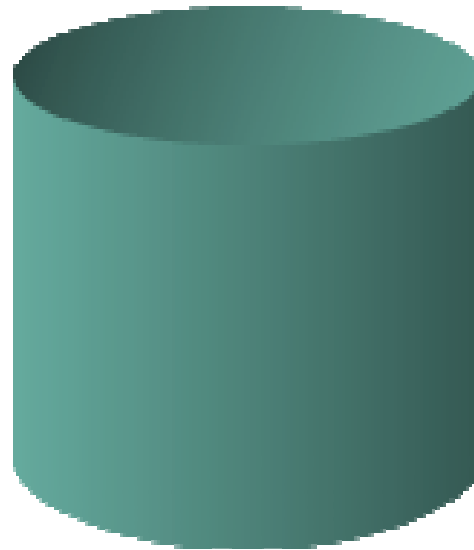


IBM DDD - TS7650G

Puede reducir en promedio 25X's la necesidad de espacio para respaldo

Proteger Mas

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Technical Forum & Executive Briefing

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Juan Felipe Cura Vazquez

LA Tape/Robotics & ProtecTIER Brand Manager

October 2011

