

# Creating Extraordinary Storage Efficiency with **IBM Real-time Compression**



**Extraordinary**  
Storage Efficiency

# IBM Real-time Compression

Make Your Storage *Extraordinarily Efficient*

## 35 Innovative Patents

22 Inventive Concepts  
Innovative Time Based Compression  
Random Access to compressed data

### Innovation



## Up to 5x more data

Compress data up to 80%  
Lossless, Deterministic Compression  
Reduce your overall \$/TB

### Storage Efficiency



IBM Real-time Compression  
Appliance for NAS



### Performance

No performance degradation  
Maximizes storage cache  
Scales linearly  
**Performance**



### Infrastructure

Maintains existing HA  
No changes to infrastructure  
No changes to applications  
**Fully Transparent Integration**



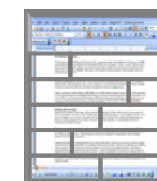
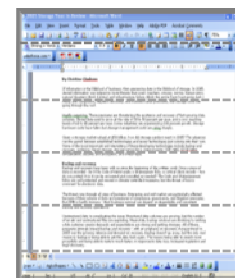
## Random Access Compression Engine – RACE

- Traditional Compression Technologies
  - Start with a constant file size
  - End – compressed file size varies on size of file and ‘compressibility’
  - Issues:
    - Large ‘chunks’ poor I/O
    - Small ‘chunks’ poor compression ratio
    - Compression ratio gets worse over time
      - Fragmentation
      - Garbage collection
    - Poor performance (to access data)
- Random Access Compression
  - Start with an unknown data stream
  - End – compressed file = consistent, logical layout
  - Benefits:
    - Time based compression
      - Understand relationship between data
    - Better compression ratios
- Preserve File Metadata for Transparency

### Traditional Compression

Fixed Input

Variable Output



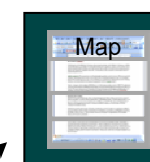
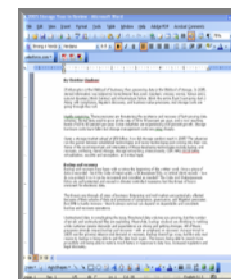
Original File

Compressed File

### Real-time Compression

Variable Input

Fixed Output



File Metadata

Compressed File

Original I/O

# What your data looks like

Address: \\10.70.1.1\bosmat\bosmat\Office_files_80P\excel				Address: \\10.10.10.16\bosmat\bosmat\Office_files_80P\excel			
Name	Size	Type	Date Modified	Name	Size	Type	Date Modified
1.xls	251 KB	Microsoft Excel Wor...	2/20/2006 11:07 AM	1.xls	32 KB	Microsoft Excel Wor...	2/20/2006 11:07 AM
qis5wkb.xls	9,779 KB	Microsoft Excel Wor...	10/24/2005 8:23 AM	qis5wkb.xls	2,041 KB	Microsoft Excel Wor...	10/24/2005 8:23 AM
QA_appliances - storages.xls	20 KB	Microsoft Excel Wor...	1/7/2008 7:55 AM	QA_appliances - storages.xls	4 KB	Microsoft Excel Wor...	1/7/2008 7:55 AM
psw11.xls	6,957 KB	Microsoft Excel Wor...	11/2/2005 4:30 PM	psw11.xls	1,921 KB	Microsoft Excel Wor...	11/2/2005 4:30 PM
Potential Street Names.xls	1,218 KB	Microsoft Excel Wor...	11/17/2005 8:10 PM	Potential Street Names.xls	293 KB	Microsoft Excel Wor...	11/17/2005 8:10 PM
NPCCFY05SOY.xls	1,225 KB	Microsoft Excel Wor...	10/1/2004 8:21 PM	NPCCFY05SOY.xls	263 KB	Microsoft Excel Wor...	10/1/2004 8:21 PM
New Microsoft Excel Workshe...	107 KB	Microsoft Excel Wor...	9/14/2008 8:53 PM	New Microsoft Excel Workshe...	23 KB	Microsoft Excel Wor...	9/14/2008 8:53 PM
New Microsoft Excel Workshe...	14 KB	Microsoft Excel Wor...	9/14/2008 8:59 PM	New Microsoft Excel Workshe...	2 KB	Microsoft Excel Wor...	9/14/2008 8:59 PM
Monthly Report.xls	22 KB	Microsoft Excel Wor...	12/17/2007 9:50 AM	Monthly Report.xls	4 KB	Microsoft Excel Wor...	12/17/2007 9:50 AM
master.xls	4,898 KB	Microsoft Excel Wor...	9/12/2005 7:10 PM	master.xls	1,321 KB	Microsoft Excel Wor...	9/12/2005 7:10 PM
ip.address.xls	699 KB	Microsoft Excel Wor...	1/8/2008 1:54 PM	ip.address.xls	50 KB	Microsoft Excel Wor...	1/8/2008 1:54 PM
Full WebGUI_V3.xls	168 KB	Microsoft Excel Wor...	12/31/2007 6:07 PM	Full WebGUI_V3.xls	31 KB	Microsoft Excel Wor...	12/31/2007 6:07 PM
existing_capacity_state.xls	4,067 KB	Microsoft Excel Wor...	2/23/2005 8:51 PM	existing_capacity_state.xls	961 KB	Microsoft Excel Wor...	2/23/2005 8:51 PM
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Copy of equivdag.xls	18,736 KB	Microsoft Excel Wor...	7/4/2003 3:58 AM	Copy of equivdag.xls	3,721 KB	Microsoft Excel Wor...	7/4/2003 3:58 AM

End User View

System Admin View  
(bypass RtCA)



# USE CASE: GENERAL PURPOSE NAS

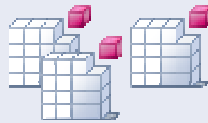
GAIN UP TO 5X MORE CAPACITY!

YOUR MILEAGE MAY VARY



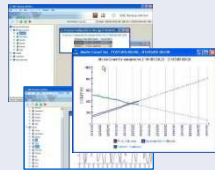
Office Files

60.0%



Databases

85.0%



CAD/CAM  
Engineering

70.0%



Virtual Servers

72.0%



Oil & Gas

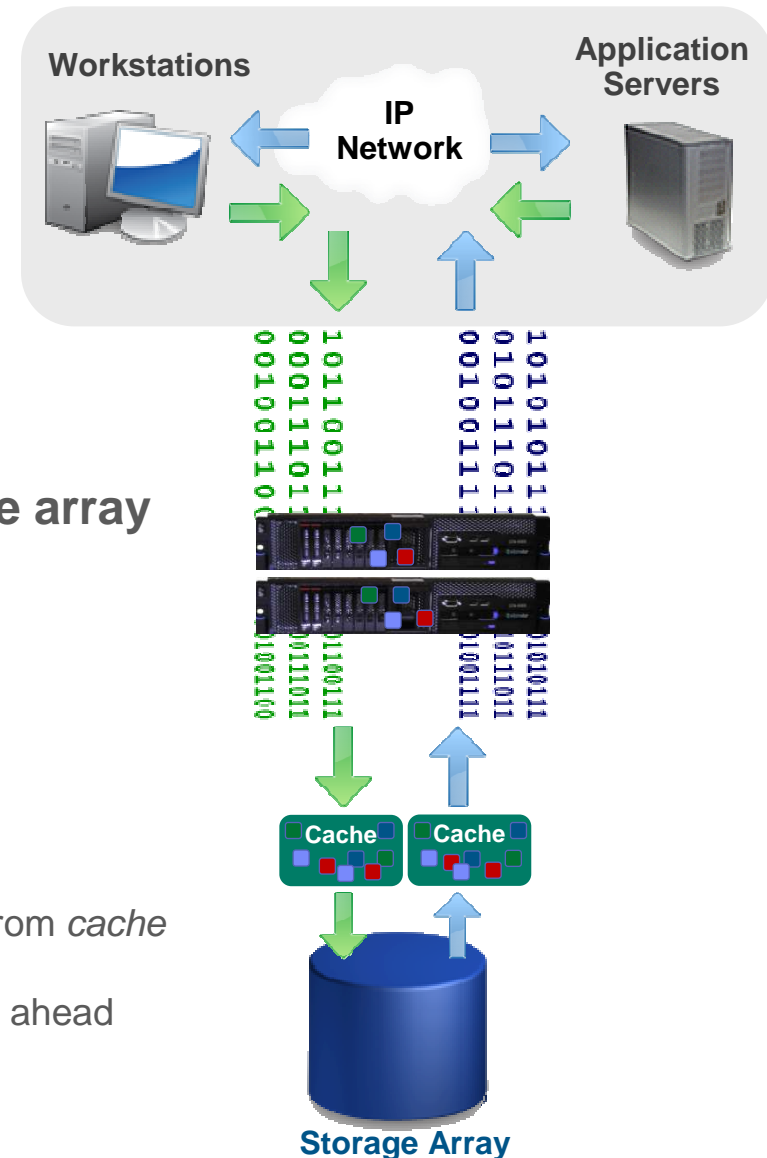
50.0%





## No Performance Degradation – How? Real-time Compression! Move, Cache and Store Less!

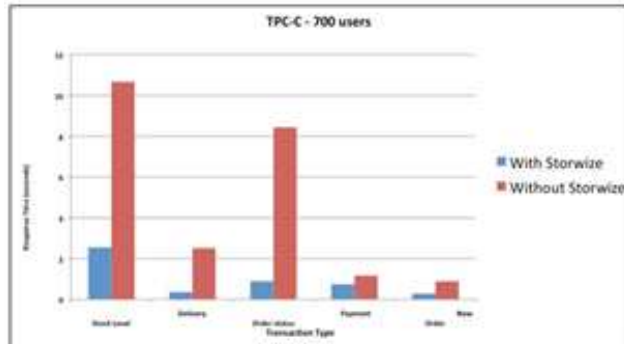
- **Real-time Compression**  
**Compresses data on initial write**
  - Less data stored on primary storage (up to 80%)
  - Much smaller I/O / lower disk workload
- **Real-time Compression**  
**Compresses data *before* it gets to the storage array**
  - Larger effective storage cache (up to 80%)
  - Array can serve more requests from its read / write cache
  - Lower storage CPU overhead
- **Real-time Compression**  
**Does not cause performance degradation**
  - Reads/Writes are faster due to storage array's response from *cache* instead of *disk*
  - Additionally reads may come from the RtC advanced read ahead cache (no write cache)



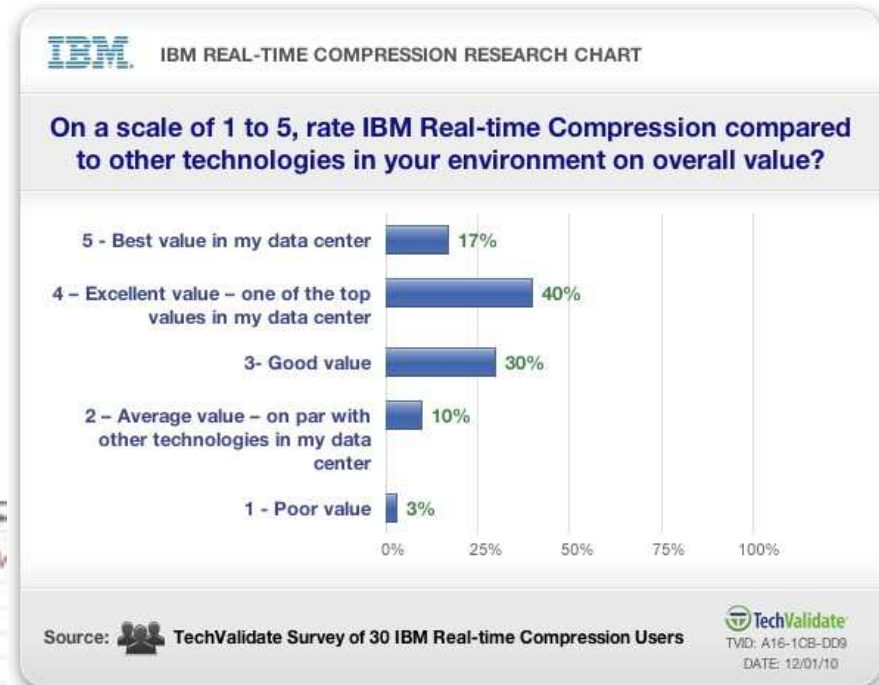
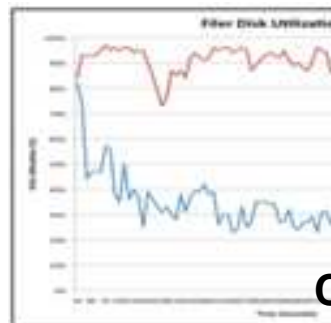


# IBM Real-time Compression – Technical Validation

## Transaction Response time



## Filer Utilization (During Benchmark)



**57% of end users rated IBM Real-time Compression an “Excellent Value” or better!**

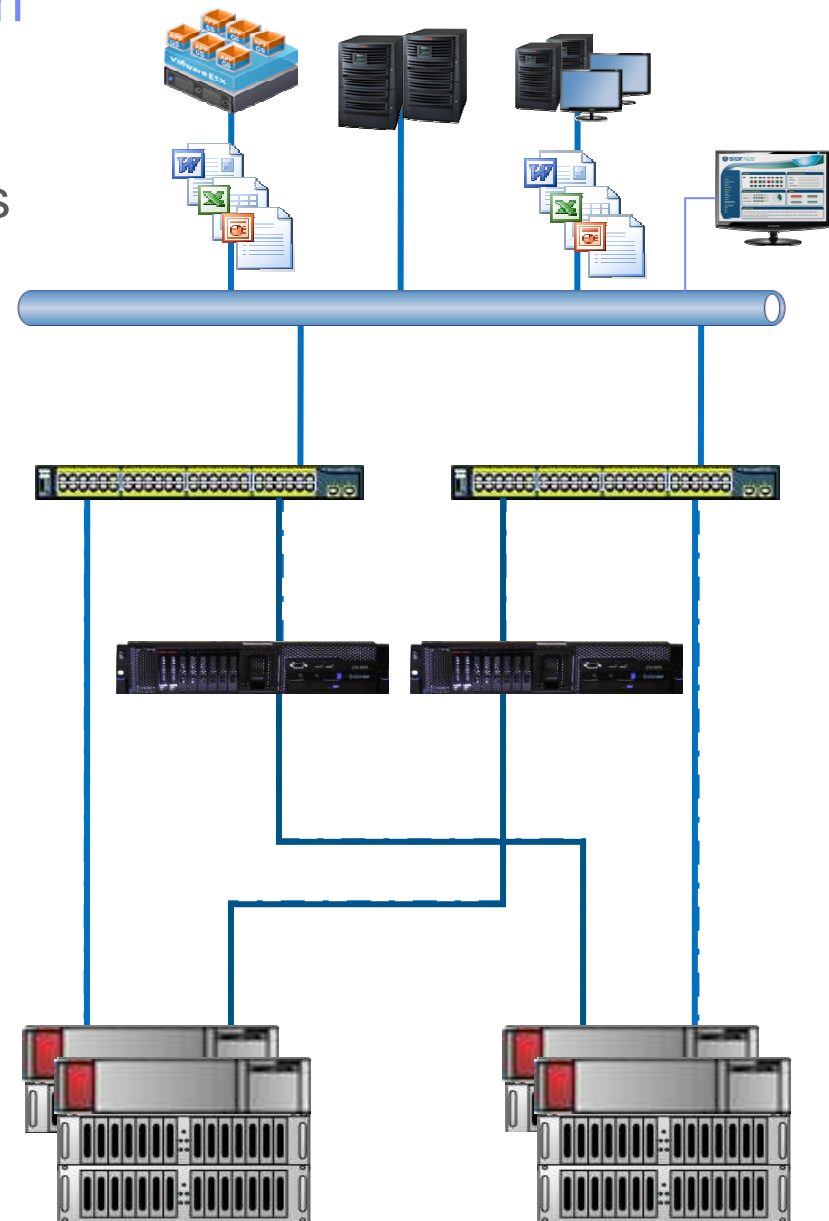
Real-time data compression is a seamless way to increase not only the capacity of the data center's NAS environment but also its overall storage efficiency throughout the data life cycle. It has proven to address performance concerns so these gains can be had without a negative impact. The result of real-time data compression is reduced storage consumption, increased data efficiency and potentially, even better performance.”

—George Crump, Senior Analyst, Storage Switzerland, LLC

## Real-time Compression Implementation *Easy Installation / Management*

- Install Real-time Compression appliances in the data path
- Configure and test implementation
  - Network – Set up network transparency
  - NAS – Add connections to Filers
  - Compression Filters
    - Choose data to compress
- Begin compressing data
- \*Run Compression Accelerator
  - Reduce already stored data

To see how easy it is to install watch:  
[IBM Real-time Compression Out of the Box Experience](#)  
On youtube – [IBM Real-time Compression Channel](#)



## IBM REAL-TIME COMPRESSION APPLIANCES FOR NAS

### Two Appliance Models



STN 6500



STN 6800

### STN 6500

- Dual 2.4Ghz Xeon Processors
- 16 1Gb Ethernet Ports
- Dual Power Supplies

### STN 6800

- Dual 2.8Ghz Xeon Processors
- 8 10Gb or 8 1Gb + 4 10Gb Ethernet Ports
- Dual Power Supplies

**BASED ON LATEST IBM X SERIES SERVER:** Multi core for enterprise level performance

### EASY CONFIGURATION

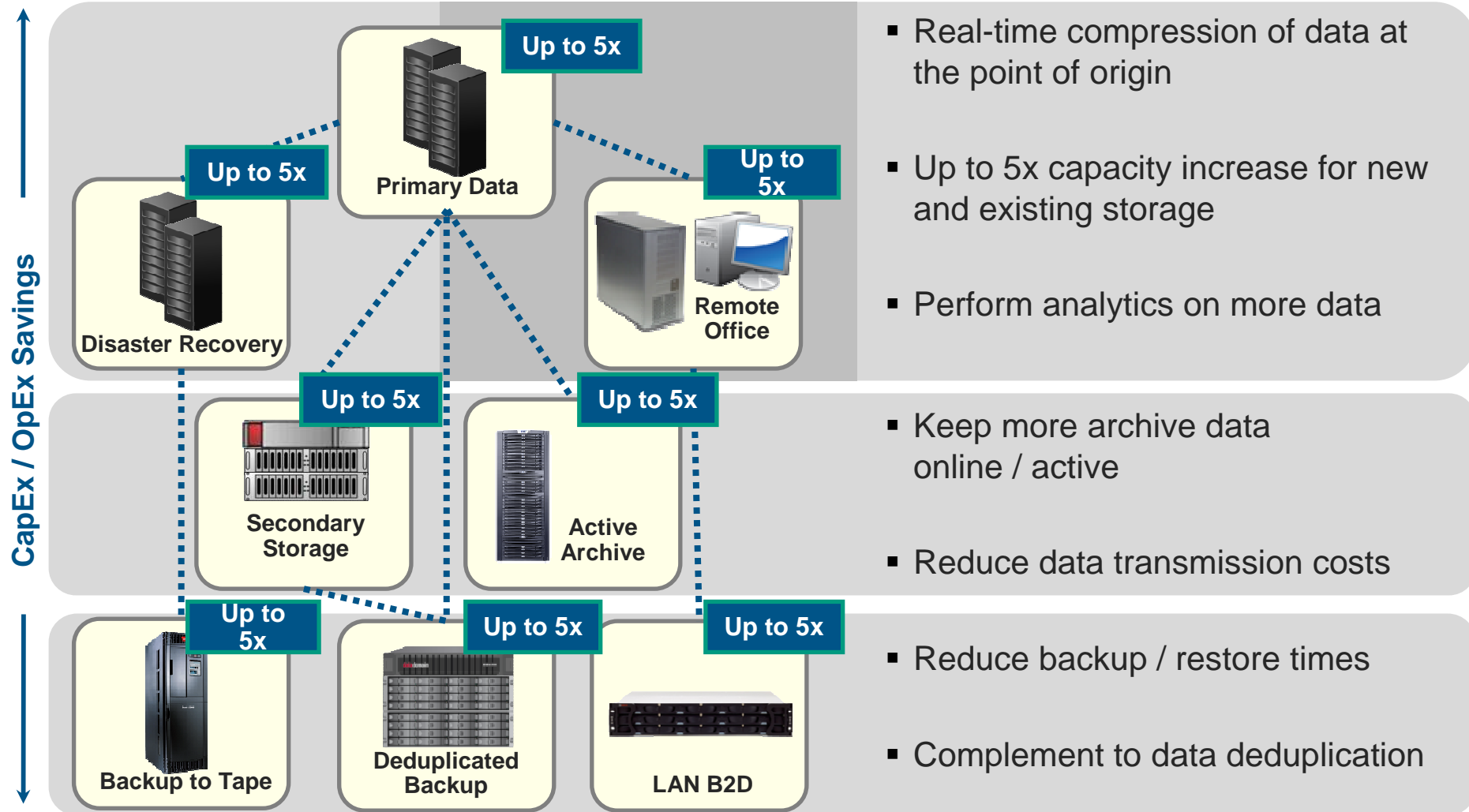
- Based on existing storage network configuration
- Deployed in HA pairs



## IBM Real-time Compression Client Results

<u>Customer</u>	<u>Results</u>	<u>Use Case</u>
<b>Shopzilla.com</b> USA	<ul style="list-style-type: none"> <li>50% increase in storage efficiency</li> <li>25% reduction in backup windows</li> <li>200% annual data growth rate managed effectively</li> </ul>	<b>EMC<sup>2</sup></b> data domain
<b>Polycom</b> Israel	<ul style="list-style-type: none"> <li>75% (4x) smaller storage footprint for home directory data</li> <li>Reduced backup window, replication costs</li> </ul>	<b>Microsoft</b>
<b>Senwes</b> South Africa	<ul style="list-style-type: none"> <li>83% (5.9x) smaller storage footprint for SAP with Oracle</li> <li>2x increase in transaction processing</li> </ul>	<b>Oracle</b>
<b>Helphire</b> United Kingdom	<ul style="list-style-type: none"> <li>75% (4x) smaller storage footprint for VMDK files</li> <li>Reduced power, cooling floor space</li> </ul>	<b>VMware</b>
<b>Mazda</b> Japan	<ul style="list-style-type: none"> <li>67% (3x) smaller storage footprint for CAD data</li> <li>More archive data kept online</li> </ul>	<b>Siemens</b> PLM

## Give Your Storage More Space - Throughout the Data Lifecycle



- Real-time compression of data at the point of origin
- Up to 5x capacity increase for new and existing storage
- Perform analytics on more data
- Keep more archive data online / active
- Reduce data transmission costs
- Reduce backup / restore times
- Complement to data deduplication

# Thank You

