

17573: Availability and Time to Data – How to Improve Your Resiliency and Meet Your SLAs

Ros Schulman – Hitachi Data Systems

Rebecca Levesque – 21st Century Software

August 13, 2015

10-11:00 am

Southern Hemisphere 5 – Disney Dolphin Hotel



#SHAREorg



RS

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About the Speakers

Ros Schulman is Director, Data Protection at Hitachi Data Systems with over 35 years experience in the IT business both on the vendor and customer side including systems programming, operations, technical support and sales support. Ms. Schulman has worked at Hitachi Data Systems for over 22 years. She currently works in the Global Solutions Strategy and Development organization with responsibility for Data Protection Software and Mainframe Management software including disaster recovery and backup software. She spends much of her time with customers, discussing their unique Data Protection challenges. She has also co-authored many white papers in the area of Business Continuity.

Rebecca M. Levesque is Chief Executive Officer of 21st Century Software and responsible for shaping the company's product strategy and vision. She has over 20 years experience helping hundreds of companies establish resiliency and recoverability strategies from any disruptive event. Her knowledge and depth of experience is offered as a speaker at SHARE, IBM Systems Magazine, ACP, and DRJ. She is a published author in trade journals, white papers, and industry forums. Additionally, Rebecca has helped executives, storage managers, and technical architecture professionals leverage their existing storage technology investments while ensuring efficiencies across the enterprise.

About this Session

Whatever type of Data Protection you have in place, this session demystifies long-standing (and often misguided) assumptions made around recoverability, availability and, more importantly, time to data. With an average of 12 to 15 copies of data out there, does your crash consistent point meet your SLA and have you considered all the variables, including batch.

Learn how one company has faced these challenges, and combined storage-based replication and host-based software to improve their SLAs, to deliver a resilient and effective recovery solution.

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Mainframe Missed Understandings

- **In this 24x7 world, in which customers want to make online transactions at any time they choose, the window for batch processing has closed significantly. Yet the amount of batch work hasn't shrunk?**

(BMC White Paper)

- **Most data center outages are caused by a systems or applications programmer, or another staff member creating a localized problem. If not caught promptly, the localized problem may spread, creating an entire systems outage?**

(Enterprise Systems)

- **It's common to have an isolated product showing 100% availability when the user is unhappy.**

(Enterprise Systems)

- **Our DR exercises have been 100% successful – how is success measured?**
- **Mainframers are open to new processes – are you?**



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Gartner Key Challenges of Backup Solutions

(Dave Russell)



Snapshot and Replication

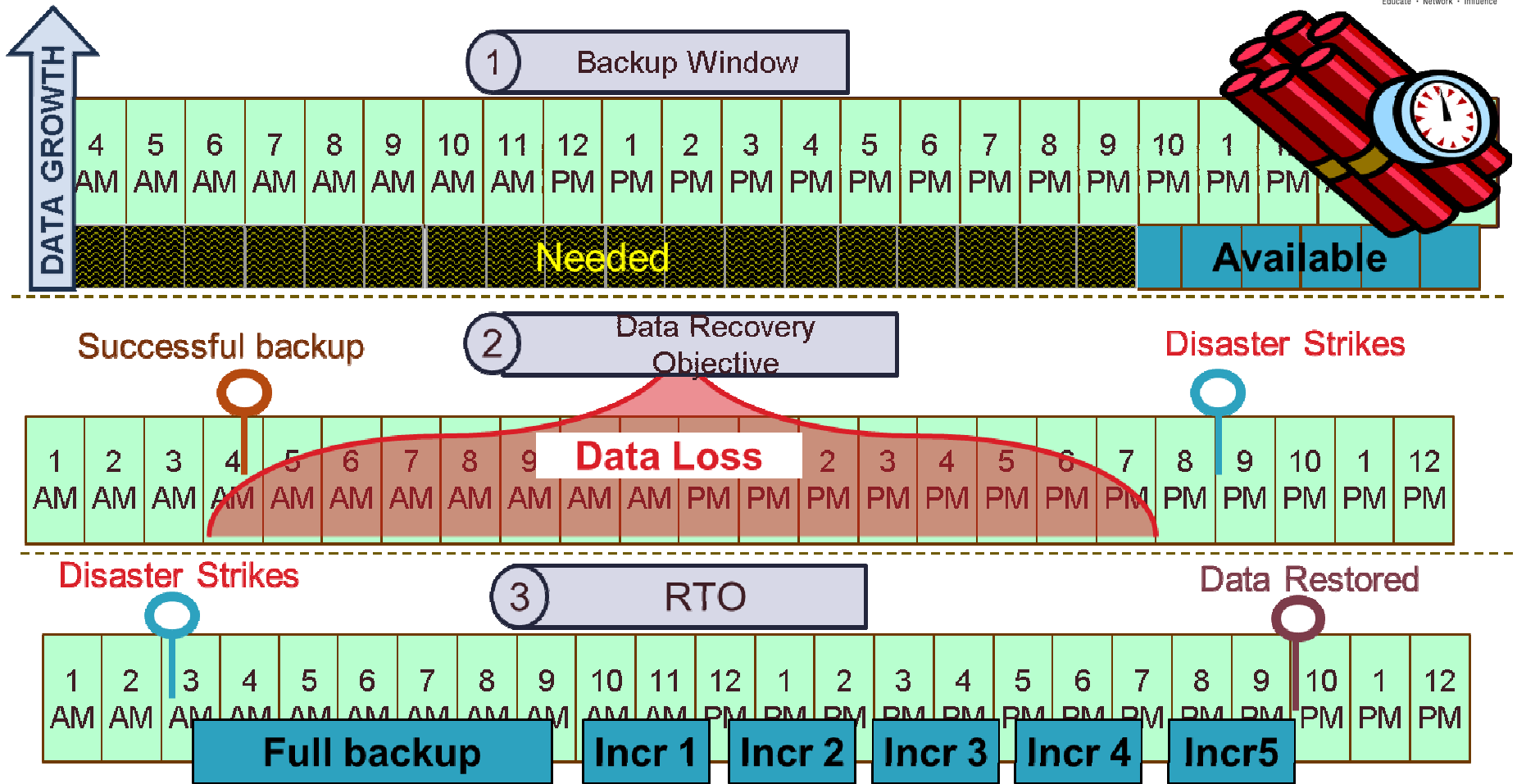
The convergence of backup and disaster recovery technologies has occurred largely because snapshot, replication and virtualization have made it possible to recover from a disaster without the need for a traditional data restoration. The methods involved in this convergence seek to minimize storage cost, while also allowing for instant recovery. (*Posey, 2014*)

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RML



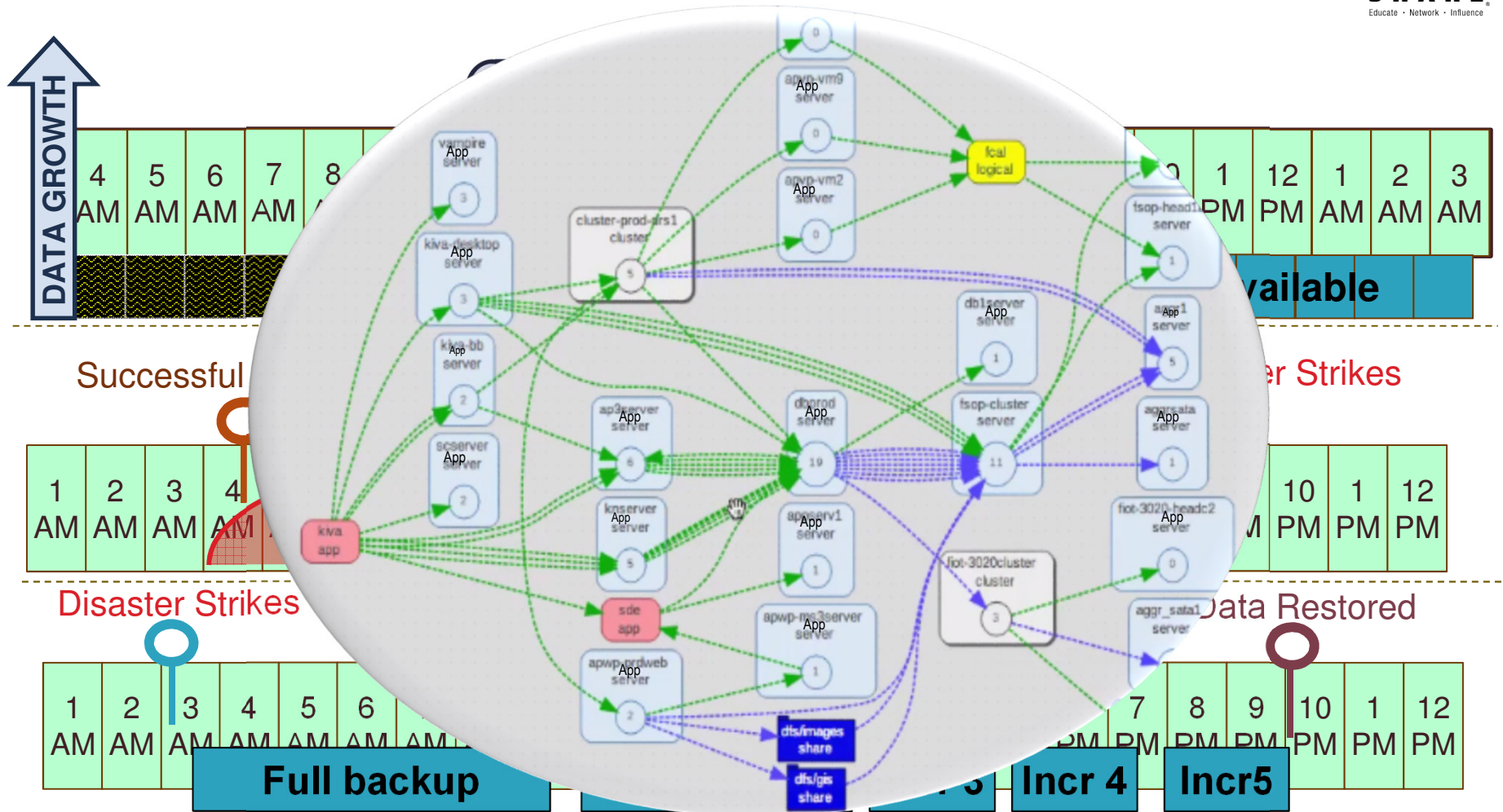
Issues with Backup - Time - Recovery



What about the problems interdependencies between apps cause?

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What is your *Recovery Point*?



And, interdependencies between apps?

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Your Business SLA

The pressure is on for business and IT services to offer 100% availability and not some number of nines, even during site disasters. Despite businesses' desire for 100% availability and "availability as a utility," IT is not yet managing service availability like a utility. IT often lacks the necessary standards, the architectures are complex and dependent on many components, and

the people and processes involved in IT service delivery now often increase the risk of downtime more than technology risks do.

September, 2014
Donna Scott - Gartner

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RPO Affects RTO = SLA

- Rapid restore and recovery from any failure is essential
- Fault-tolerant rapid recovery application environments are needed
- With mainframes this includes both transactional and batch processing
 - Applications and databases have advanced transaction recovery features
 - Batch jobs present a different problem
- What is continuous data protection (CDP) and near-CDP?

CDP Definition

- Continuous data protection (CDP) - recovery approach that continuously, or nearly continuously, captures and transmits changes to files or blocks of data while journaling these changes
- Some CDP solutions can be configured to capture data either continuously (true CDP) or at scheduled times (**near-CDP/snapshots**)
- Near-CDP is often done every few minutes or hours, minimizing potential data loss

Percentage Uptime Achieved Per Year

	Uptime	Maximum Downtime/Year	% Missed*
Six nines	99.9999%	31.5 seconds	
Five nines	99.999%	5 minutes 35 sec	
Four nines	99.99%	52 minutes 33 sec	63%
Three nines	99.9%	8 hours 46 min	34%
Two nines	99.0%	87 hours 36 min	25%
One nine	90.0%	36 days 12 hours	

From <http://www.continuitycentral.com/feature0267.htm>

*Continuity Software Survey (10/2014)

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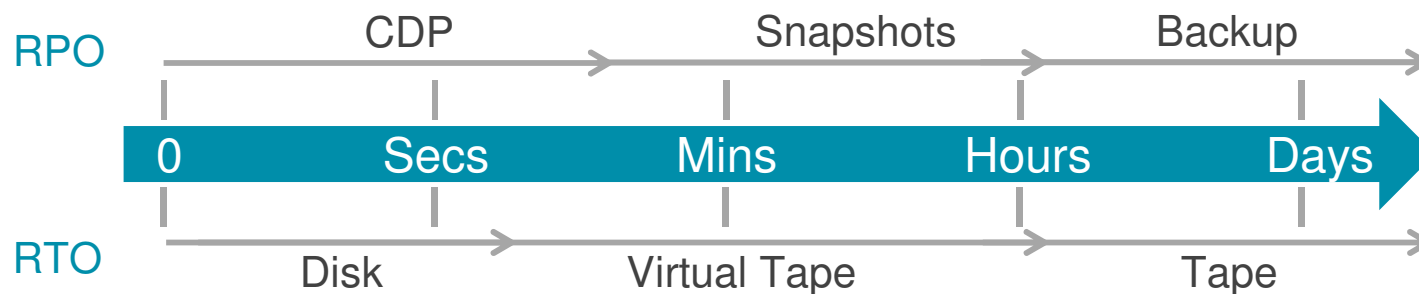
Operational or DR ... or Both?

- Continuous availability enables 24/7 access to IT-enabled business functions, processes and applications
- Involves two strategies: high availability (minimizing unplanned downtime) and continuous operations (minimizing planned downtime)
- Sometimes, continuous availability architectures embody disaster recovery strategies
 - IT service processing continues despite disaster events
 - Gartner refers to this as "multisite continuous availability"

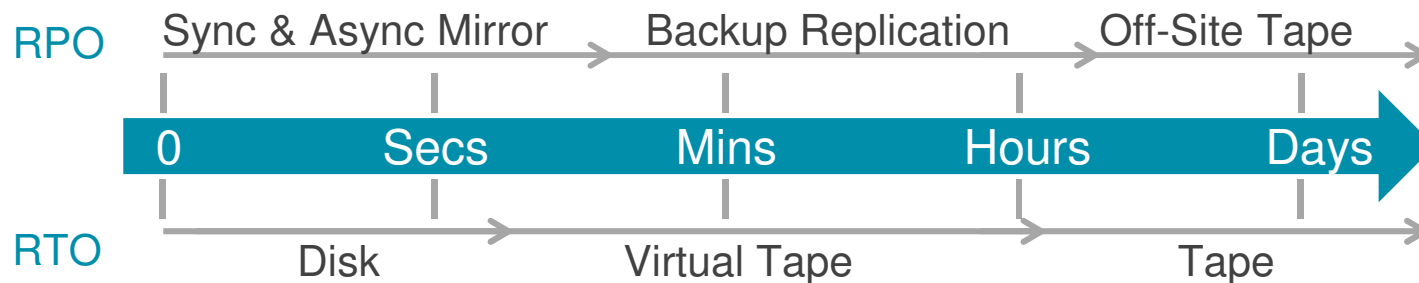
(Gartner, Donna Scott - 2014)

Recovery Classes and Performance

- Operational Recovery (restore a file, folder, volume, system)



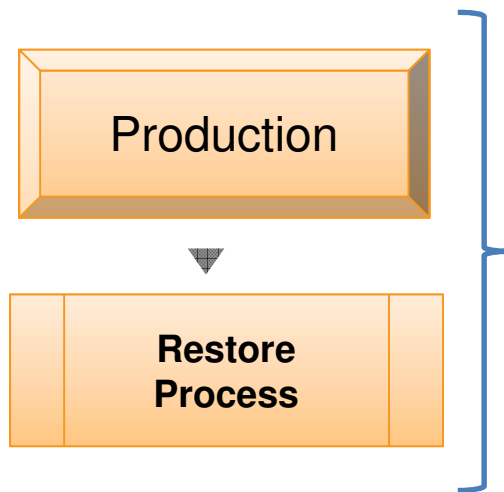
- Disaster Recovery (restore operations at/from another location)



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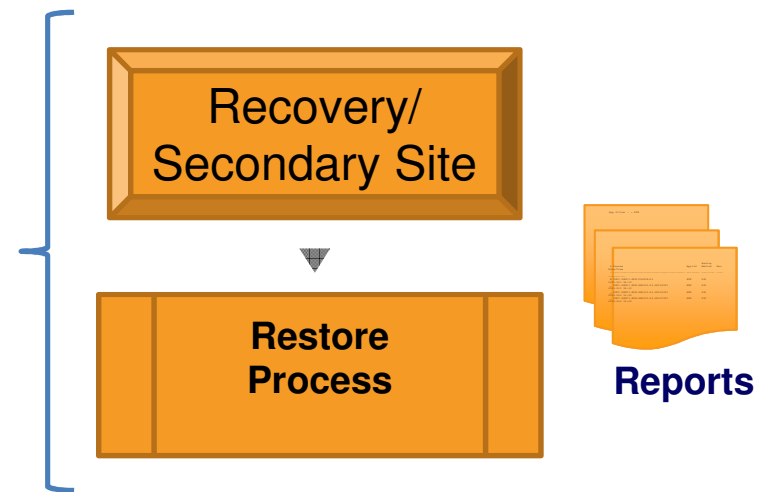
IT Resiliency – Where, Why, How Long

Operational Restore



Operational Resilience
Disruptive Event

DR



SLAs do not care whether primary or secondary site is affected
- any failures due to corruption, deletion, and other possible reasons requires restoration/recovery and affects Time to Data

SLA Tiers – Tie Solutions to SLA

- Determine SLA per application
 - Tier 1 - continuous availability requirement, maximum four minutes downtime a year
 - Tier 2 - high availability, maximum of one outage per year, maximum four hours outage per year
 - Tier 3 - recovery essential within 24 hours, maximum three outages per year
 - Tier 4 - recovery required within three days, maximum four outages per year
 - Tier 5 - delayed recovery, all other services

(Hiles, Continuity Central, 2015)



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Data Protection Technologies and Recovery Time

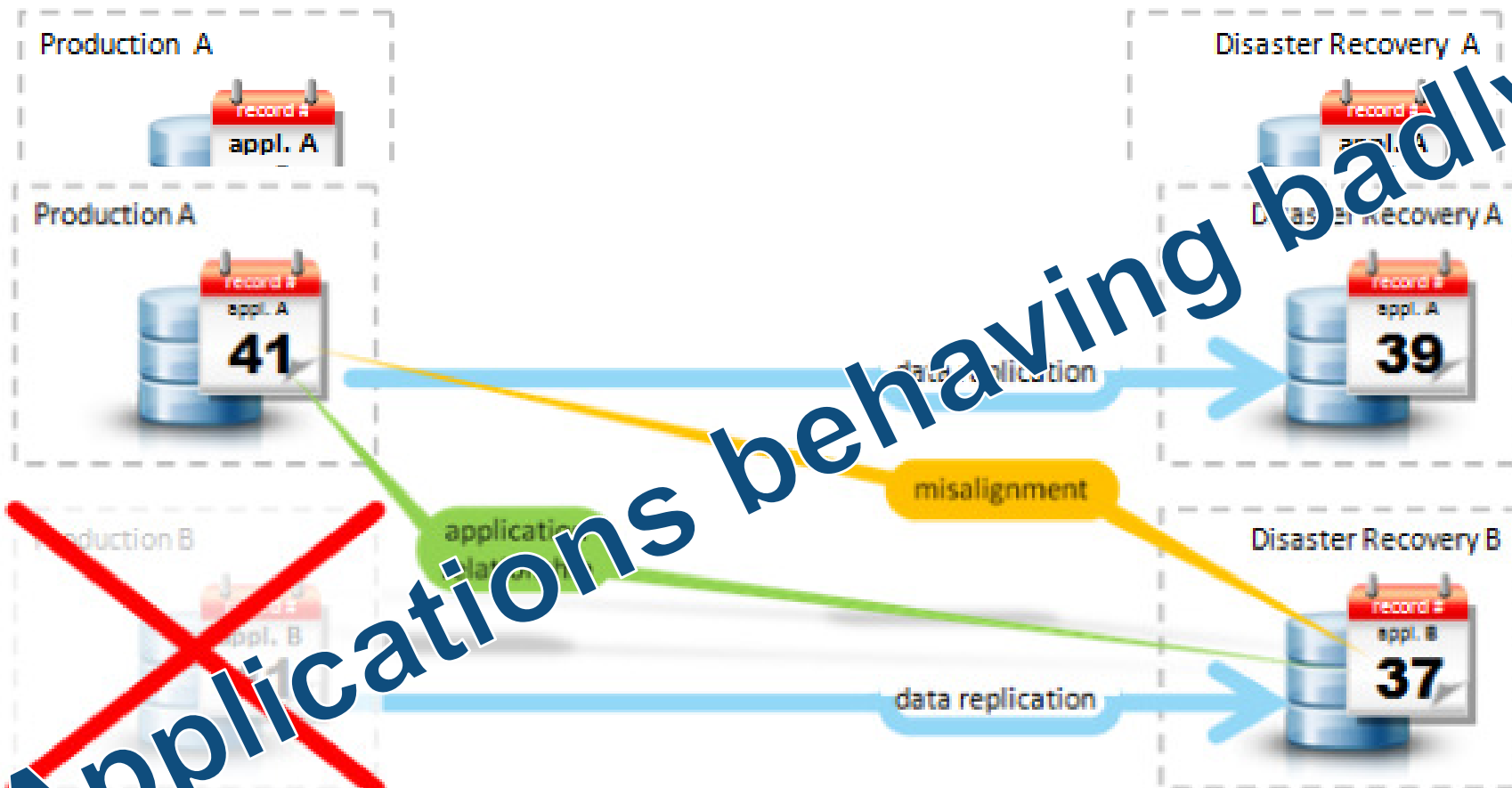


Technology	RPO Range	RTO Range	MAX Downtime per year	SLA
Archive	Static	Depends		Hours
Traditional Backup to Tape/Disk including VTL or PBBA	24-168 hours	1-24 hours	1d 19h 49m 44.8s	Hours 99.5%
Snapshot, near-CDP With or without Application Awareness	Minutes – 36 hours	15 mins – 12 hours	4 Hours 22 minutes	Minutes 99.95%
Synchronous Replication	0-2 mins	1-4 hours	4 Hours 22 minutes	99.95%
Synchronous Replication with Failover	0-2 mins	5-60 mins	52 mins – 5 mins	99.99%- 99.999%
Asynchronous Replication	0-60 mins	1 – 8 hours	4 hours 22 mins	99.95%
Asynchronous Replication with Failover	0-60 mins	30 mins – 4 hours	52 mins	99.99%
3 DC (Sync/HA and Async)	0-60 mins	5 mins – 4 hours	4 hours 22 mins -5 mins	99.95%- 99.999%

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Batch Application Crash Consistency Problem



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Establish Problem and Appropriate Solution

- Square expenditure and focus with expectation
 - Too much focus on DR and not enough on resiliency
 - Does not solve operational recovery issues
 - Suitable solutions for smaller, local failures
- High availability does not solve everything
- Establish SLA's to meet business, not rely on RTO/RPOs
 - Use the right technology
 - Application uptime is the name of the game
- Most replication technologies cannot create crash consistent data
 - May be ok for databases
 - What about open or stranded datasets
 - Non-database application recoverability requires different approach for both operational recovery and DR



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Other Considerations

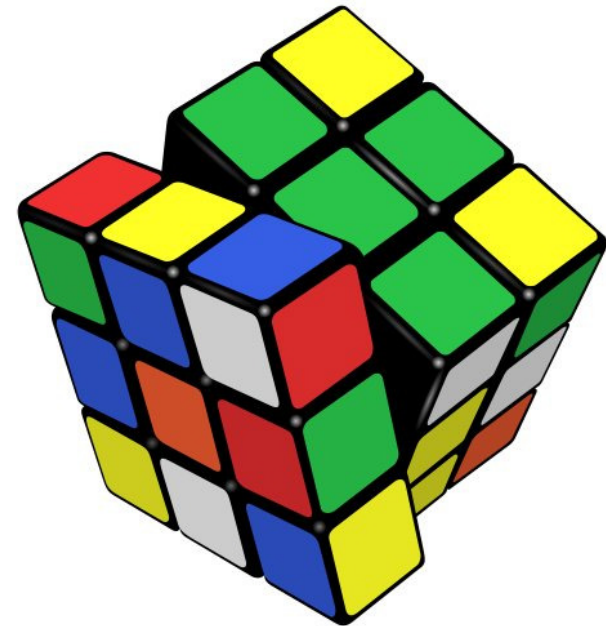
- Storage replication, software replication alone doesn't automate and guarantee failover
- Failover waits for "go ahead" – or automate and roll the dice
- Corruption
- Tape/DASD speed differential
- SLA achieved through approach
- What about GDPS?
 - Batch has to be restarted even with GDPS
 - Potential for transactions to have been stranded in the failed site

“Attempts to apply the stranded changes to the data in the active site may result in an exception or conflict, as the before image of the update that is stranded will no longer match the updated value in the active site.”

(IBM Share - August, 2012)

One Customer's SLA Challenge

- Credit card processing
- Interlocking dependencies
- 24/7 operation
- Payment Card Industry (PCI) standards
- RTO = 15 minutes
- Current manual processes unable to meet RTO
- Production control system programmer to handle issues



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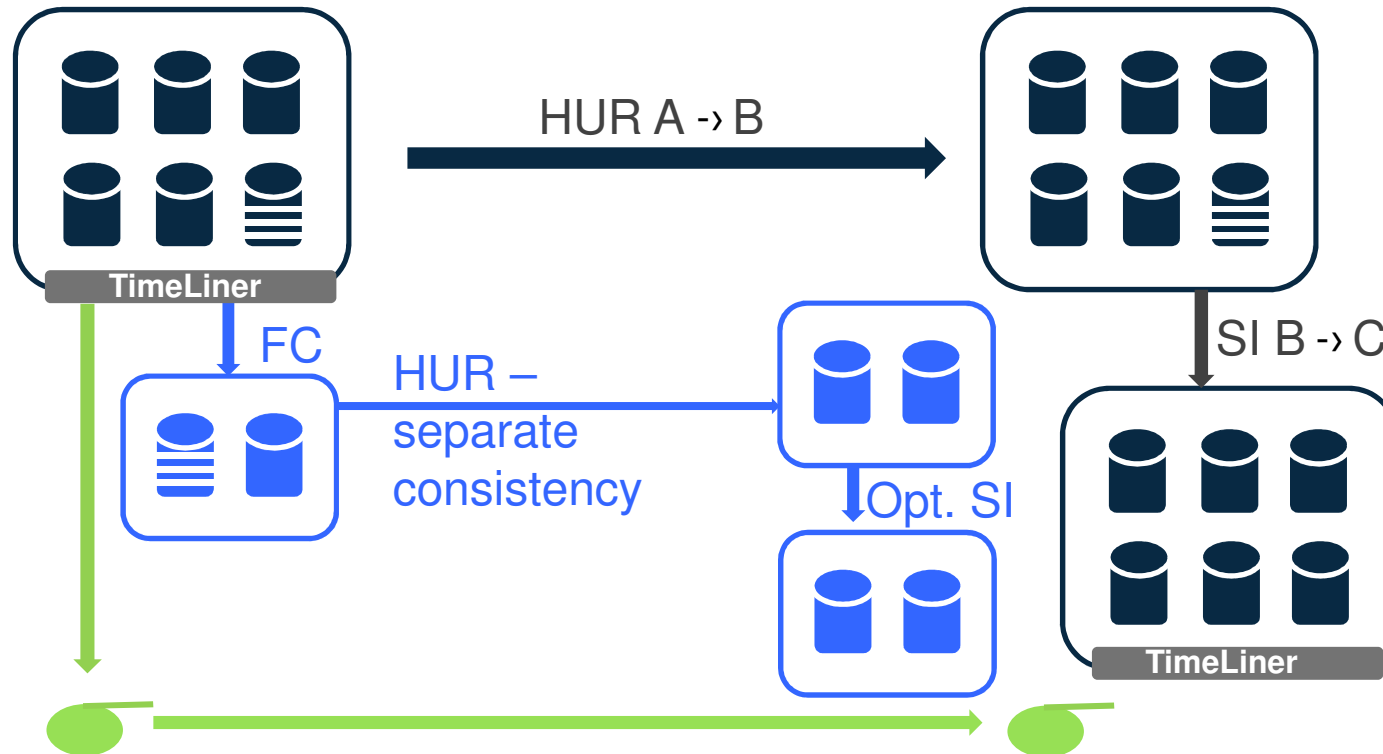
One Customer's Approach

- Individual failure inevitable
- Fault tolerant storage
- Remote replication with multi-site DC operations
- Snapshot and recovery system for application state, data checkpoints, and recovery (point-in-time or PIT)
 - Batch journal-like database
 - Open datasets identified
 - Restore via panel



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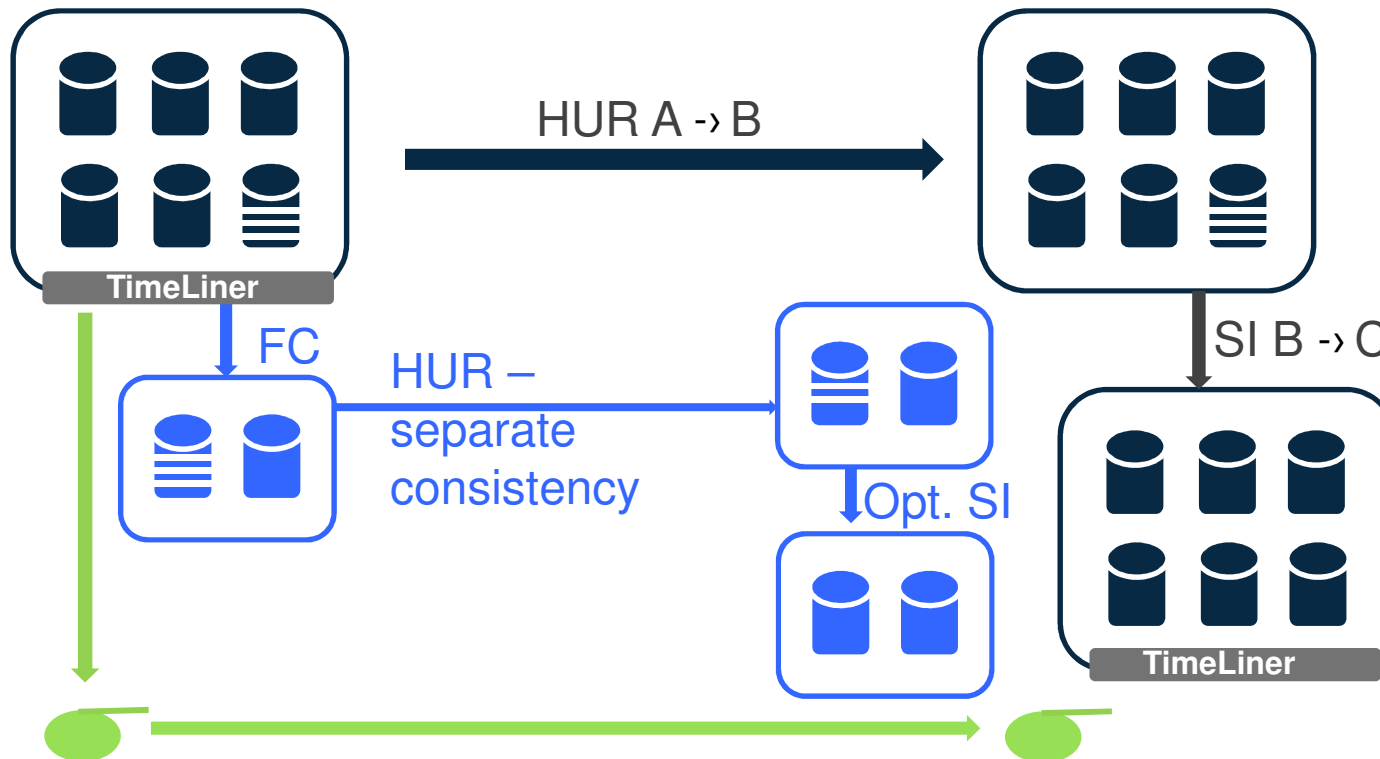
Mainframe Environment Example



TimeLiner, InstaRestore & InstaSnap are patent pending technologies

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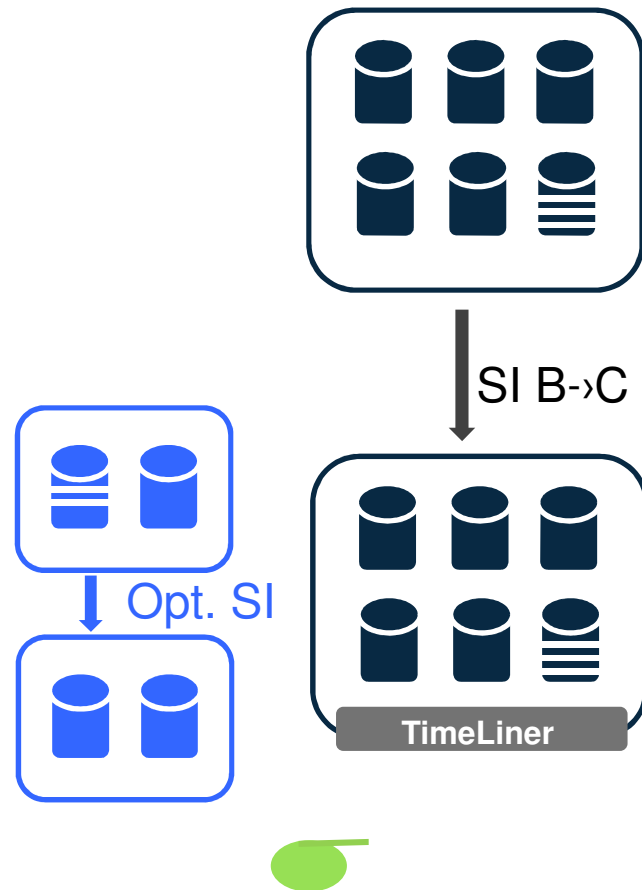
Mainframe Environment Example



TimeLiner, InstaRestore & InstaSnap are patent pending technologies

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Mainframe Environment Example



On restart, TimeLiner and InstaSnap recognize that all of the FC data is not available for the third PiT.

It will then roll back to the second PiT for job recovery.

TimeLiner, InstaRestore & InstaSnap are patent pending technologies
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Time to Data...

... is the ultimate determinant of SLA effectiveness

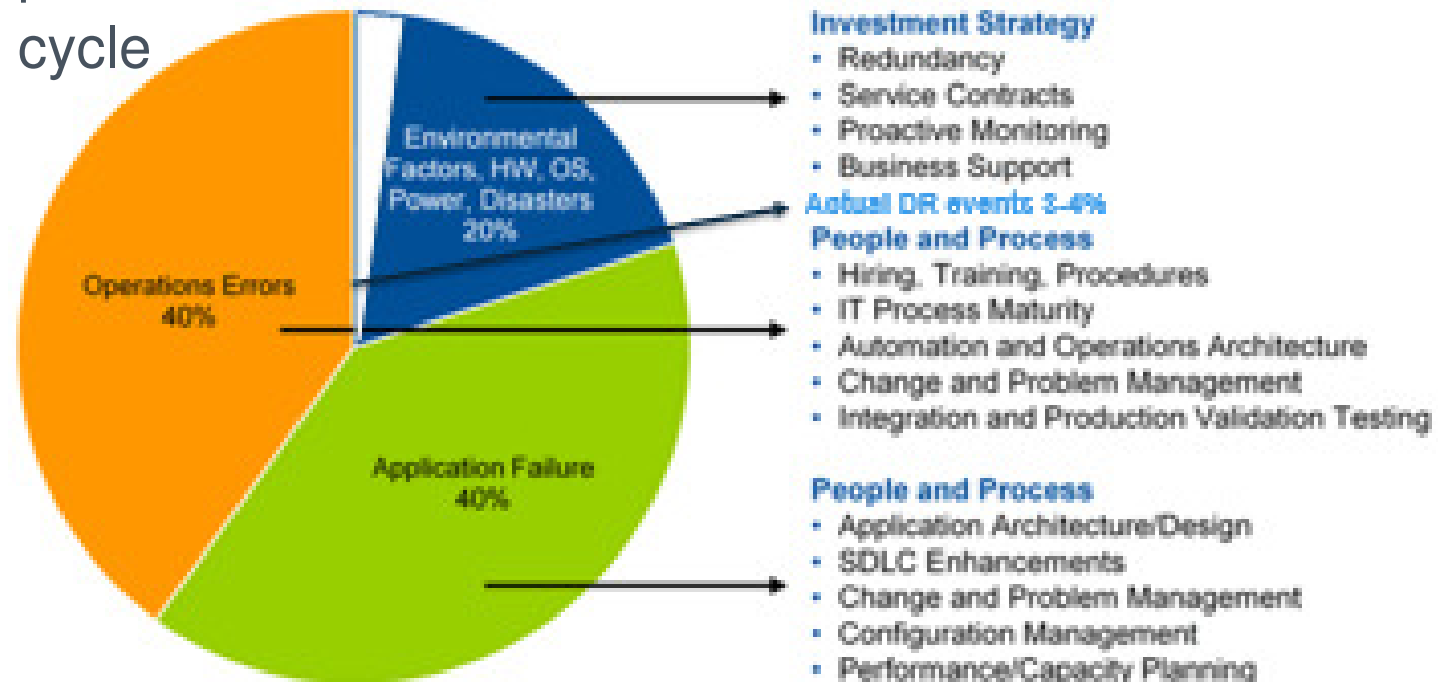


*The amount of **TIME** required to restore application access to a business is what separates a temporary **Operational Restore** from a full-blown **DISASTER***

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Questions to Ponder

- SLA's
 - Are business SLAs achievable currently and do they match RTO/RPO's?
 - Do you have the right technology to map to you SLA's
- What do you test from a recovery standpoint
 - DR – unplanned failover
 - Data corruption
 - Mid-batch cycle
 - Deletions



Complete your session evaluation:

Hitachi Mainframe Business Continuity Portfolio

IN-SYSTEM REPLICATION SOLUTIONS	REMOTE REPLICATION SOLUTIONS	REPLICATION MANAGEMENT SOLUTIONS
ShadowImage® In-System Replication For full volume clones of business data with consistency (ATTIME split with HUR)	Hitachi TrueCopy Synchronous, consistent clones at remote location up to 300km (~180 miles)	Hitachi Business Continuity Manager (BCM) Replication management in z/OS environments
IBM-Compatible FlashCopy Point-in-time volumes and datasets via IBM command set in z/OS environment	Hitachi Universal Replicator (HUR) Any distance, unique use of 'Pull' technology and Journal Volumes to accommodate link outages or interruptions	Hitachi Replication Manager with mainframe BCM "Enterprise-wide" GUI replication management and monitoring for mainframe and open systems
IBM-Compatible FlashCopy/SE Point In Time volumes with virtual volume pool as target vs. whole volumes	IBM-Compatible XRC* Asynchronous remote replication via compatible with IBM XRC in z/OS environment <small>* Note: Only available as a migration tool to HUR</small>	IBM Basic HyperSwap, GDPS HyperSwap certification and/or integration High-availability storage for z/OS environments

Replication Assessment, Migration and Implementation Services

Best practice designs that ensure results and lower risks in implementation

Replication Score Card (Health Check) Services

Periodic checkups that ensure continued solution value

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21st Century Software z/OS Portfolio

Data Resiliency	Storage Management & Usage	Tape Migration
<p>VFI</p> <ul style="list-style-type: none"> • Slashes recovery time objectives and assures SLAs • Erases recoverability gaps, ensures resiliency, and reduces storage • Enables recovery to job/dataset level through real-time architecture and patent pending software code (InstaSnap, InstaRestore, and Timeliner) • Focuses on intricate, application-level dependencies • Protects InFlight data and maximizes snap copies sync'ed to application backups • Cross-application dependencies 	<p>Total Storage</p> <ul style="list-style-type: none"> • True knowledge for storage and management class • Insightful reporting for JCL coding to avoid policies • Tier data based upon usage, reference, and criticality (from VFI) • Data modeling for new purchase or improving allocation and utilization <p>SpaceFinder</p> <ul style="list-style-type: none"> • Intelligent resource management tools 	<p>Tape/Assist Migration in Place</p> <ul style="list-style-type: none"> • Reduces cost of managing tape resources while providing continuous availability • Director and high speed copy utilities • Backend utility processes assure referential data • Portability, disaster recovery, and backup copies for data resiliency • Consolidation of data • Expertise to assist in migration management

Recovery Resiliency, Storage Management and Modeling, Tape Migration and Implementation Services

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Questions?

Thank you!

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Thank You!

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