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Mirror Activator for ASE & Oracle in an EMC Environment

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Mirror Activator for ASE & Oracle in an EMC Environment



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Mirror Activator for ASE & Oracle in an EMC Environment



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Mirror Activator for ASE & Oracle in an EMC Environment



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SYBASE®

Mirror Activator for Oracle and Sybase

- Business Continuity Strategies
- Traditional Solutions
- Mirror Activator Solution for Oracle and Sybase
- Mirror Activator and SRDF
- Steps for Implementing Mirror Activator with SRDF
- Mirror Activator Roadmap

Market Overview: Business Continuity Strategies

- **How do our customers currently protect their databases and their capacity to operate?**

Typical Strategies

- Disaster recovery (DR)
- Storage Replication
- Synchronous mirroring
- Business continuity
- Transaction replication
- Snapshot mirroring

Multiple Products Involved

- EMC SRDF
- Sybase Rep Server
- Sybase OpenSwitch
- EMC Timefinder
- Mirror Activator

Sybase Solution Areas

Continuous Multi-Site Availability
HA Clusters & Transaction Replication

ASE HA Option + Storage Replication
+ Sybase Mirror Activator

Multi-Site DR & HA: Synchronous
Storage & Transaction Replication

Storage Replication + Sybase Mirror
Activator

Multi-Site HA: Asynchronous
Transactional Replication

Sybase Replication Server

Multi-Site
File Availability Storage Replication

Storage Replication

Site Availability
HA Clusters & HA Software

ASE HA Option

Server Availability
Hardware Redundancy: RAID/Mirroring/ Hot Swap CPU's

Disk & Hardware Vendor Hot Swap &
Redundancy

Server Recovery
Cold Standby: Backup / Restore Database & Log

Sybase Backup Server

Traditional Solutions

Synchronous Replication	Asynchronous Replication
No data loss – guaranteed	Potential data loss in case of failure
Distance limited due to performance considerations	Scalable over large distances
Impacts application performance due to synchronous I/O	Minimal impact to application performance

Traditional Solutions

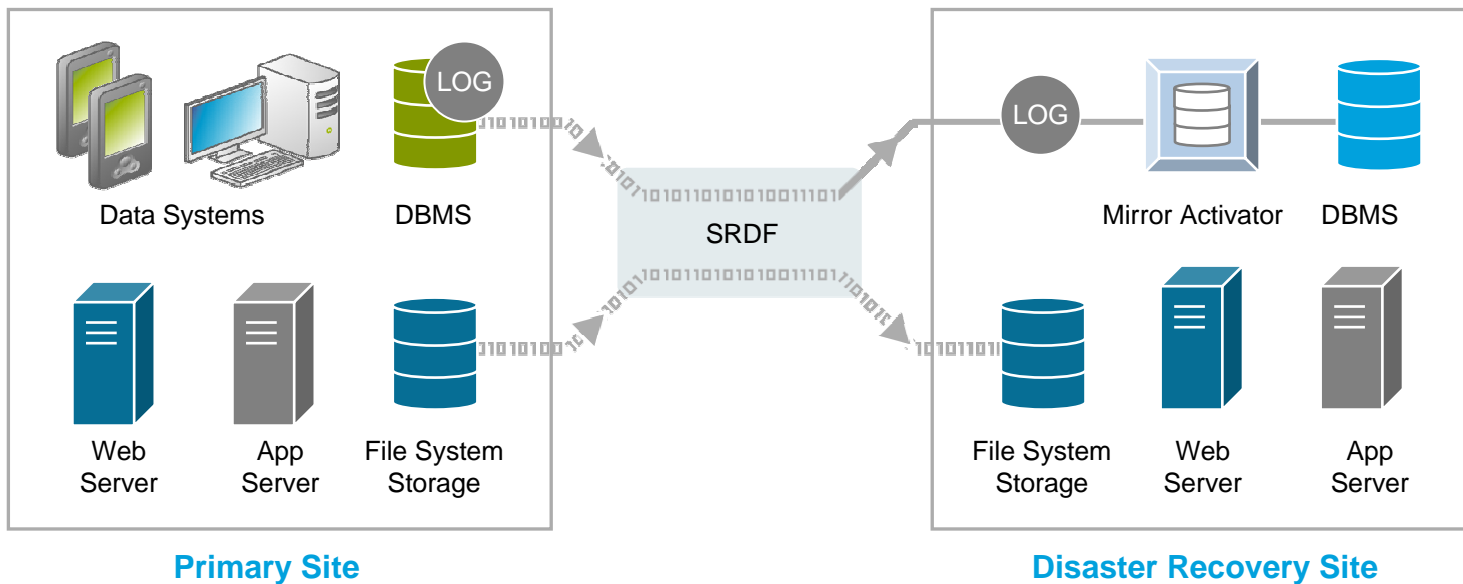
Storage Replication	Transaction Replication
Synchronous or asynchronous	Asynchronous replication only
Handles DR for complete environment (DB, App/Web Servers, File System)	Limited to DBMS disaster recovery
Secondary site resources cannot readily be leveraged	Standby site fully usable for reporting and decision-support
Does not protect against logical corruption	Protects against logical corruption
Storage platform dependent	Storage platform independent
Addresses high availability and disaster restart only	Running database used for HA/DR, integration, data distribution

Mirror Activator Solution for Oracle and Sybase

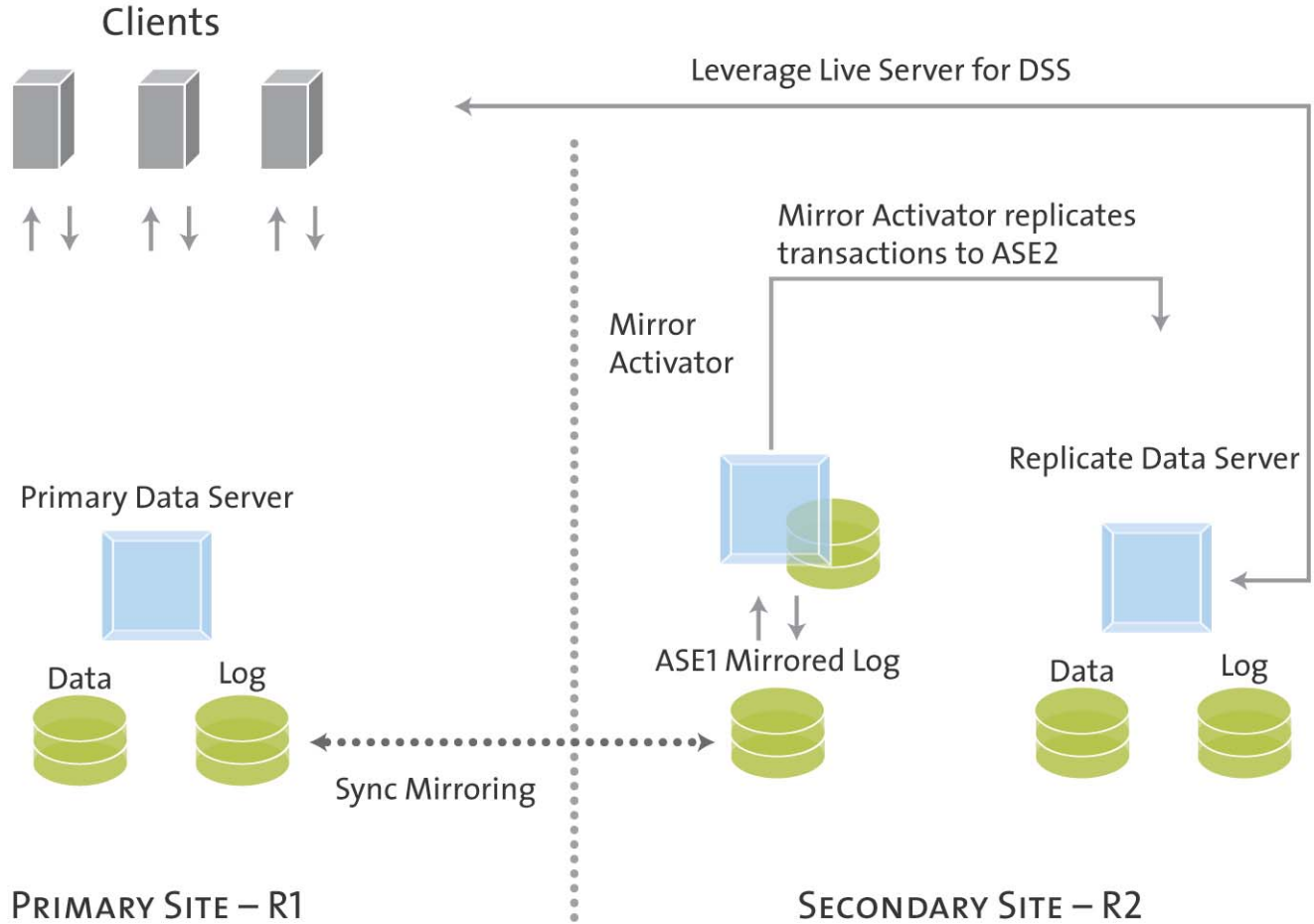
- **Mirror Activator is an innovative solution for business continuity that enhances traditional database replication methods. It virtually eliminates downtime for business-critical applications by providing a continuously-available standby system.**
 - Works in conjunction with Storage Replication solutions
 - Lowers the total cost of ownership by significantly reducing the network bandwidth required for database disaster recovery
 - Protects against logical data corruption since the standby DBMS is maintained through logical replication
 - Guarantees transactional consistency of the standby DBMS at any time
 - Increases availability by minimizing loss of business in the event of planned/unplanned downtime
 - Increases utilization of the standby database by making it available for reporting and decision support

Bridging The Gap

- **Mirror Activator addresses the gap created by using either storage replication or transaction replication alone**
 - Leverages storage replication technology to provide a live standby DBMS with guaranteed transactional integrity
 - Works with EMC SRDF, IBM PPRC, Veritas Volume Replicator, NetApp SnapMirror, and Hitachi TrueCopy



Mirror Activator Architecture



“The bandwidth requirements of mirroring and the lack of ‘real time’ replication in transaction replication are potential hurdles to achieving a cost-effective disaster recovery architecture that also safeguards the currency of the standby data. Sybase Mirror Activator takes an innovative ‘middle way’ by combining the best elements of these two strategies, with dual goals of ensuring transactional integrity and reducing strain on the network.”

–Bill North,
Research Director for Storage Software
IDC



EMC Corporation

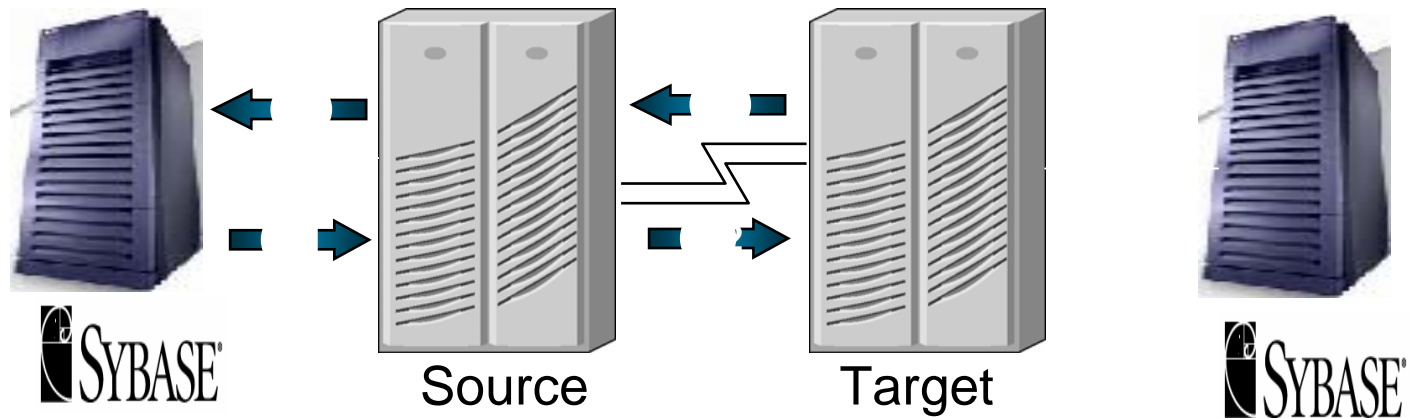
Agenda

- **The “hybrid” solution**
- **SRDF Overview**
- **Sybase Mirror Activator with EMC SRDF**
 - Pros and cons of implementation methods
- **Solutions Summary**

Storage and Database Replication “Hybrids”

- **EMC combines technologies with Sybase to create;**
 - Restart solutions
 - Recovery solutions
 - Running database solutions, called “hybrids”
- **Sybase Mirror Activator with EMC SRDF combines block replication with transactional replication technology**
 - Does not fall into the category of traditional restart or recovery
 - This is a **running** database solution which we call a “hybrid”

Synchronous SRDF (SRDF/S) High Level Architecture

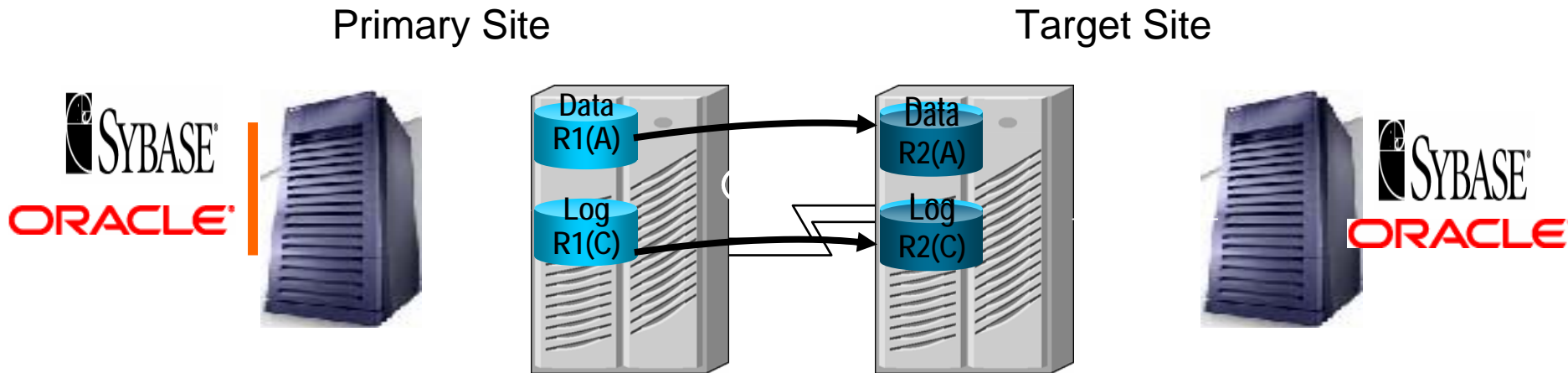


1. A **Write** received from host / server into cache of source
2. The **Write** is transmitted to the cache of the target
3. Receipt acknowledgment is provided by target back to cache of source
4. Ending status is presented to host / server

Mirror Activator with EMC SRDF

- **SRDF replicates to the target site**
 - Mirror Activator reads the target (R2) device containing the primary database log, then asynchronously applies the data to the standby database using transaction replication
- **SRDF/S and SRDF/A are supported for Sybase**
 - Mirror Activator for Sybase went GA in Jun. '04
- **SRDF/S and SRDF/A are supported for Oracle**
 - Mirror Activator for Oracle went GA in Mar. '06
- **Value Proposition**
 - Target systems, applications and databases are online and running at all times
- **EMC SRDF implementation methods**
 - Mirror Activator using Concurrent SRDF (sync or async)
 - Enterprise Restart Consistency Groups (sync or async)

Mirror Activator Materialization Concurrent SRDF

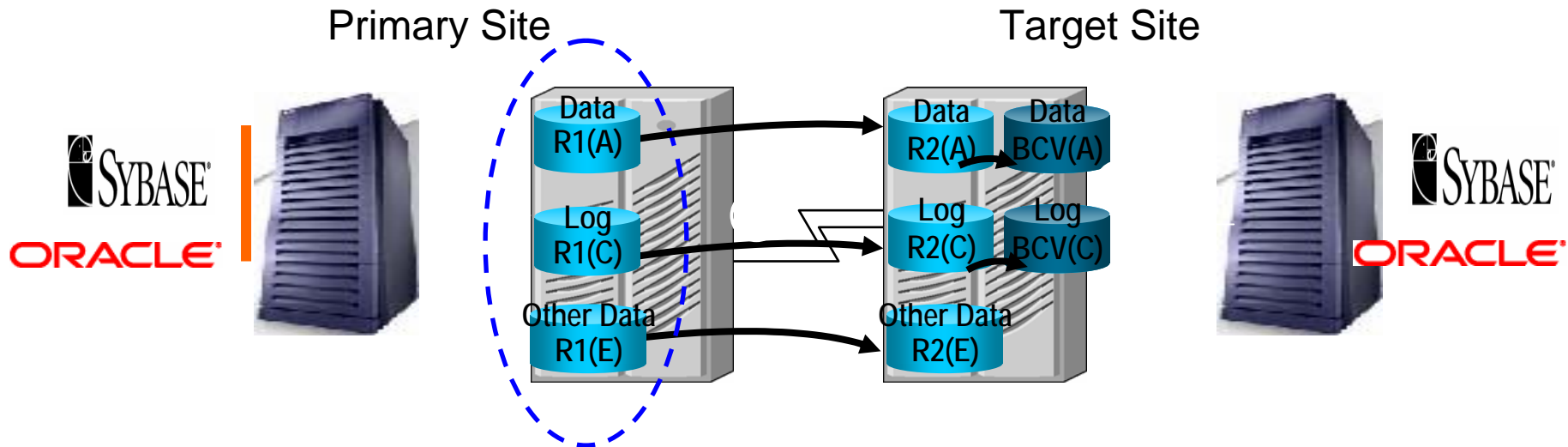


1. Initial synchronization to remote
2. Quiesce primary database – or shutdown instance
3. Split the target devices from source
4. Bring secondary db online – unQuiesce the primary, or restart

Pros/Cons with Concurrent SRDF

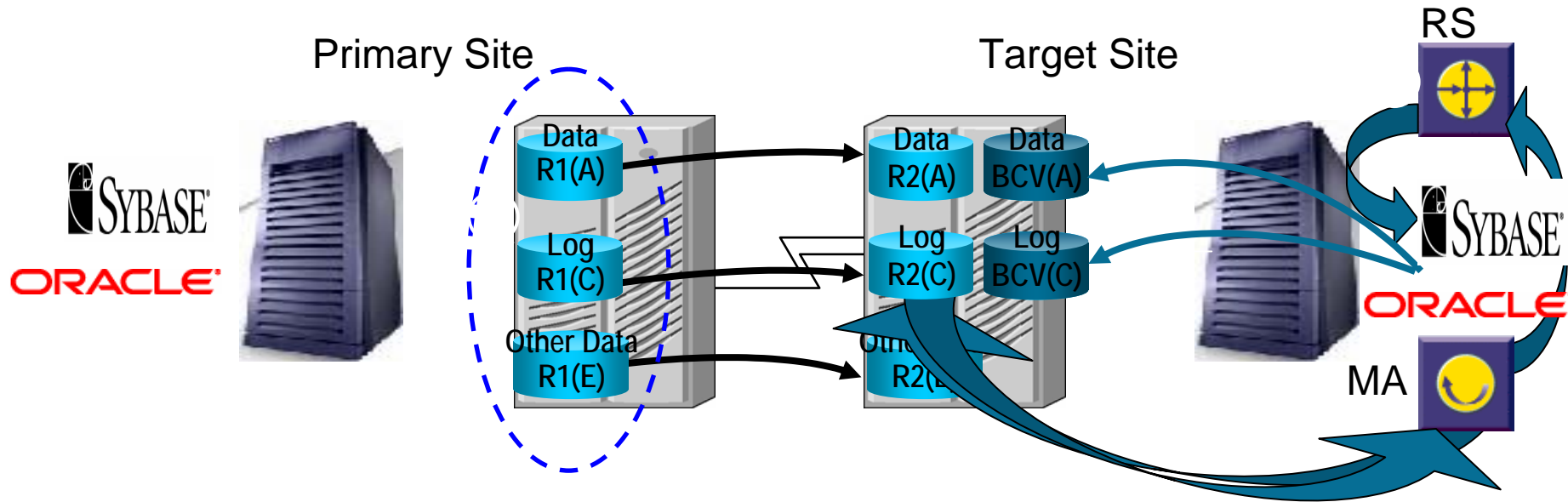
- **Pros**
 - Zero data loss solution (with SRDF/S)
 - Reduces RTO (recovery time objective) in the event of disaster
 - Reduced bandwidth (due to only replicating the primary database log)
- **Cons**
 - The target database (Sybase/Oracle) that is being updated by Mirror Activator, cannot be a member of the Consistency Group
 - **Alternative – use Enterprise Restart Consistency Group implementation**
 - The failover/failback (also known as “go home”) procedures are complex

Mirror Activator Materialization Enterprise Restart Consistency Groups



1. Define and establish a consistency group. Synchronize remote BCVs
2. Quiesce primary database – or shutdown instance
3. Split the remote BCV devices from source
4. Bring secondary online – unQuiesce the primary, or restart

Mirror Activator Replication Enterprise Restart Consistency Groups



1. Verify Consistency Group is established and enabled to R2s, and BCVs are split
2. Attach the Mirror Activator (MA) to the R2 primary db log device
3. MA reads the active primary log and updates the Replication Server (RS)
4. RS redistributes changes to secondary db

- **Pros**
 - Zero data loss solution (with SRDF/S)
 - The target database may be included in the Consistency Group
 - Provides an independent BCV copy of the database/instance that can be used for reporting, queries, analytics and database consistency checking, without impacting production **or** the DR copy
 - Failback (“go home”) procedures are simple and part of the basic SRDF feature set
- **Cons**
 - Requires additional bandwidth and storage

- **Mirror Activator with EMC SRDF provides a zero data loss solution that has been proven to meet the low RTO & RPO business requirements of our customers with mission critical applications.**
- **SRDF/S provides block replication good for mission critical data protection with zero data loss.**
- **SRDF/A provides block replication good for long distances with no host impact.**
- **Concurrent SRDF for MA provides a flexible storage implementation**
 - the target database resides on R2 devices.
- **Consistency groups for MA provides a mechanism to create a dependent write consistent image necessary to restart the entire Enterprise in the event of disaster**
 - the target database resides on remote BCVs.

- **Requirement**

Immediate data availability in the event of a failure

Zero data loss

Better return on assets

Eliminate Data Inconsistencies

- **Mirror Activator delivers:**

- Recovery within seconds
- Eliminates risk of failover failures due to data inconsistency
- Synchronous replication provides a zero data loss solution
- Live stand-by systems provide read-only access to near real-time data for maintenance windows or DSS uses.
- Ensure data integrity and protects against data corruption