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"Effective Disaster Recovery Solutions: Combining Sybase Mirror Activator and EMC SRDF"

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SYBASE

Agenda

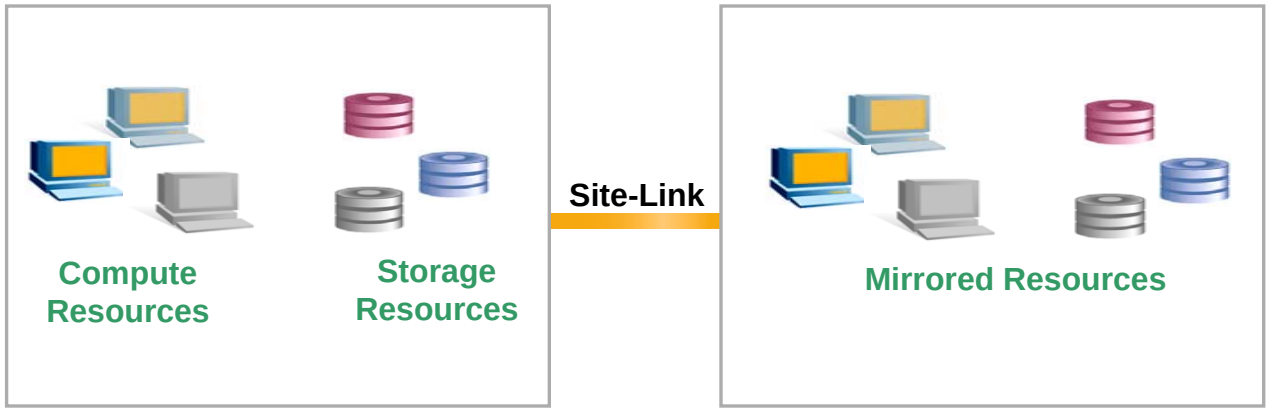
- Business problem
- Sybase solution
- Current alternatives
- Mirror Activator
- Mirror Activator with EMC SRDF
- Summary

Business Challenges

Needed:

Fast, cost effective way to protect database transactions

- **Currently, the resources spent on Disaster recovery (Site, Storage, Networking, etc.) are viewed as "expensive insurance"**
- **Your business can't afford to lose any transactions or be unavailable**
- **Your business needs a way to leverage the resources at the Disaster Recovery site for reporting/query**



Primary Site

Disaster Recovery Site:
✓ Strategic Investment

Current Alternatives

- **Disaster recovery options**
  - Unfortunately, traditional disaster recovery solutions are viewed as “expensive insurance” because of their considerable costs and low return on investment (ROI).
  - Tier-one disaster recovery solutions require a system that replicated mission-critical data from an active (or primary) site to a standby (or alternate) site synchronously.
  - The two viable alternatives for replication in a disaster recovery solution are: **Disk Block Replication** or **Transaction Replication.**

Traditional Solutions

Types: Synchronous vs. Asynchronous

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

Methods: Disk Block vs. Transaction Replication

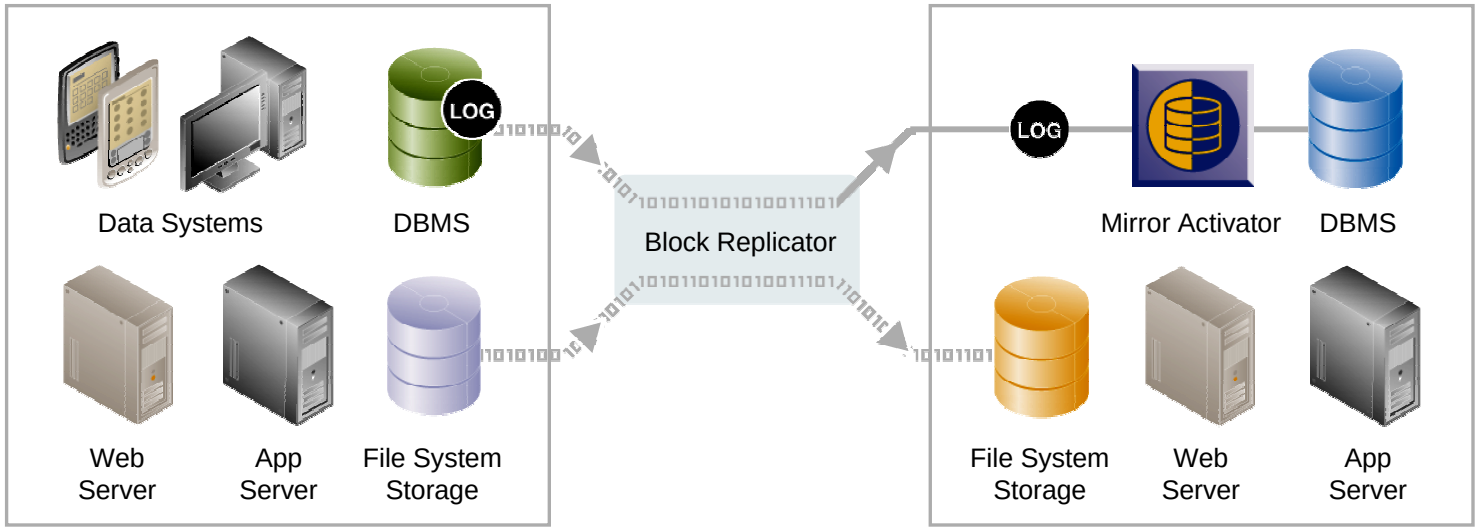
Disk Block Replication	Transaction Replication
Synchronous or asynchronous	Asynchronous replication only
Handles DR for complete environment (DB, App/Web Servers, File System)	Limited to DBMS disaster recovery
Host or device-based	Host-based only
Secondary site resources cannot be leveraged	Standby site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

Sybase Solution—Mirror Activator

- **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 Disk Block Replication solutions
  - Lowers the total cost of ownership by significantly reducing the network bandwidth required for database disaster recovery
  - Protects against 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

- **Sybase Mirror Activator addresses the gap created by using either storage replication or transaction replication alone.**
  - Works in conjunction with storage replication vendors to provide a live standby DBMS with guaranteed transactional integrity
  - Extensive testing with EMC SRDF (white paper available)
  - Works with EMC SRDF, IBM PPRC, Veritas Volume Replicator, NetApp SnapMirror, and Hitachi TrueCopy



Reduces Network Bandwidth

- Reduces TCO by significantly decreasing the required network bandwidth by up to 50%
- Reduces the amount of memory cache needed for the storage replication, since it is only mirroring the log
- Improves performance and response time for applications
- Only the primary log-devices need to be mirrored

Reduces Risk

- **Ensures transactional integrity of secondary data and protects against data loss**
  - Replication is performed logically – using SQL statements off the replicated log device
  - Provides transactions in the correct order – disk replication ensures that all log transactions are replicated
- **By using disk mirroring, synchronous replication guarantees zero data loss in the event of disruption during replication**
- **Protected against data corruption**

Increases Availability of Data

- Minimizes loss of business by reducing failover time – since secondary site is always available, the failover of applications is achieved in seconds or minutes as opposed to hours
- Increases service levels for the business
- Designed to avoid any single point of failure and provide automatic and graceful recovery from system failure

Improving the Economics of Business Continuity

“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 MA 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

Summary

Requirement:	Mirror Activator Delivers:
Immediate data availability in the event of a failure	▪ Recovery within seconds ▪ Eliminates risk of failover failures due to data inconsistency
Lower TCO	▪ Log-based replication reduces network bandwidth by 50%
Zero data loss	▪ Synchronous transaction replication ensures data integrity and protects against disk corruption
Better return on assets	▪ Live stand-by systems provide read-only access to near real-time data for maintenance windows or DSS uses

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Kelly Bedard
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Sr. Corporate Systems Engineer

SYBASE

Mirror Activator with EMC SRDF/S

- **SRDF/S synchronously replicates to the target site while Mirror Activator reads the SRDF R2 device and asynchronously applies the data to the standby database using SQL**
- **Target systems, applications and databases are online and running at all times**
- **EMC is currently the only vendor with a certified solution available today**
- **Two EMC SRDF/S implementation methods**
  - Concurrent SRDF or Consistency Groups
- **Mirror Activator with SRDF/S value proposition**
  - Dependent upon implementation

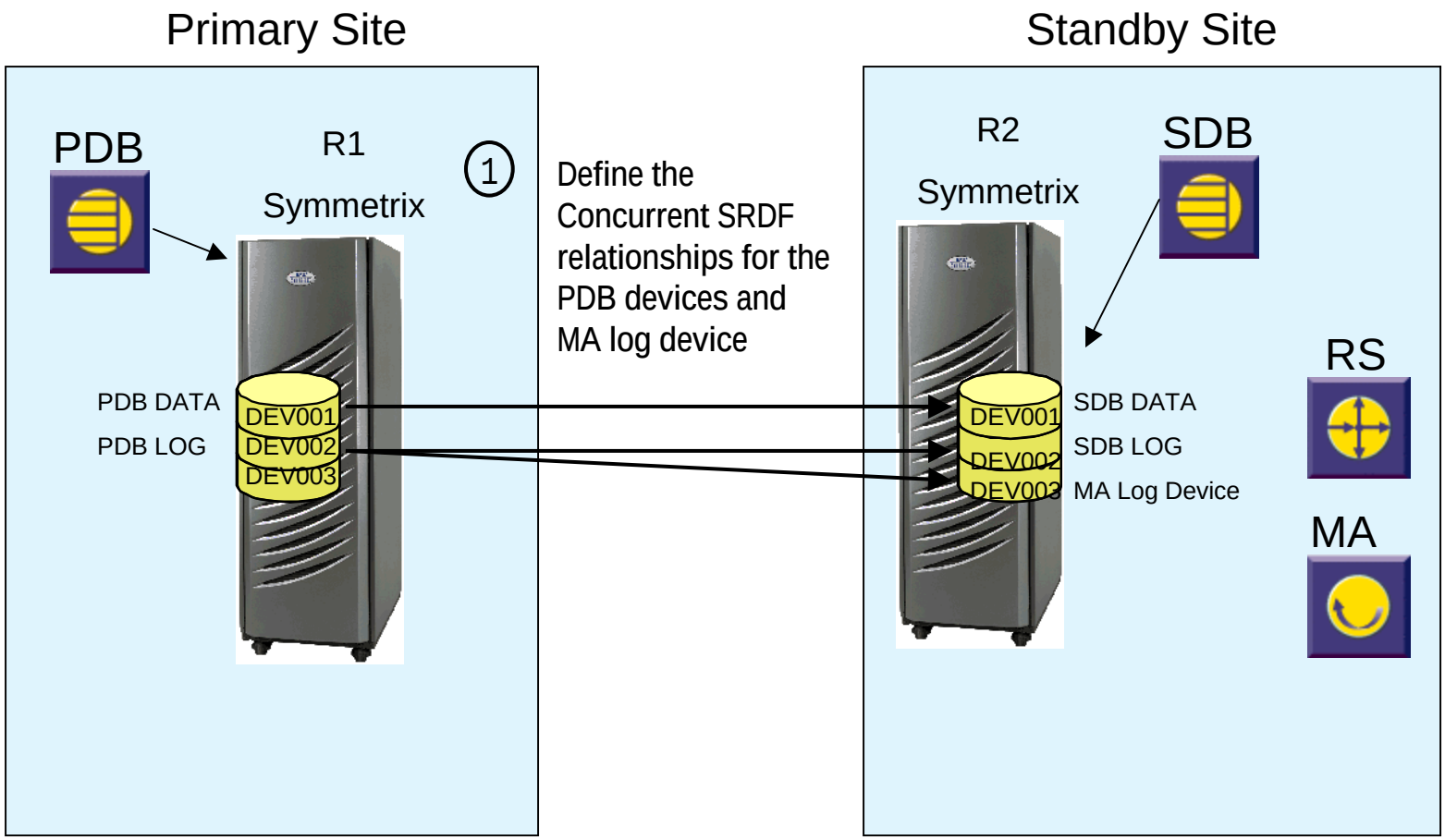
Considerations for Implementing MA with SRDF/S

- **Choose a materialization method**
  - Act of initially loading data from the primary to standby database
  - Various methods using SRDF/S
- **Configure SRDF/S**
  - Use Concurrent SRDF or Consistency Groups
- **Configure the Sybase Mirror Activator**
  - Includes Mirror Activator Agent & Replication Server
- **Initialize SRDF/S replication**
  - For ongoing/future replication

Minimum Requirements for the MA with SRDF/S

Sybase	Sybase Mirror Activator	12.6
Sybase	Sybase Adaptive Server Enterprise (ASE)	12.5.0.3 ebf #1
EMC	Primary & Target Symmetrix models	5568 (Symms should be at same Enginuity level)
EMC	Solutions Enabler	5.4
EMC	PowerPath	4.0

Sybase Mirror Activator –
Materialization for Concurrent SRDF



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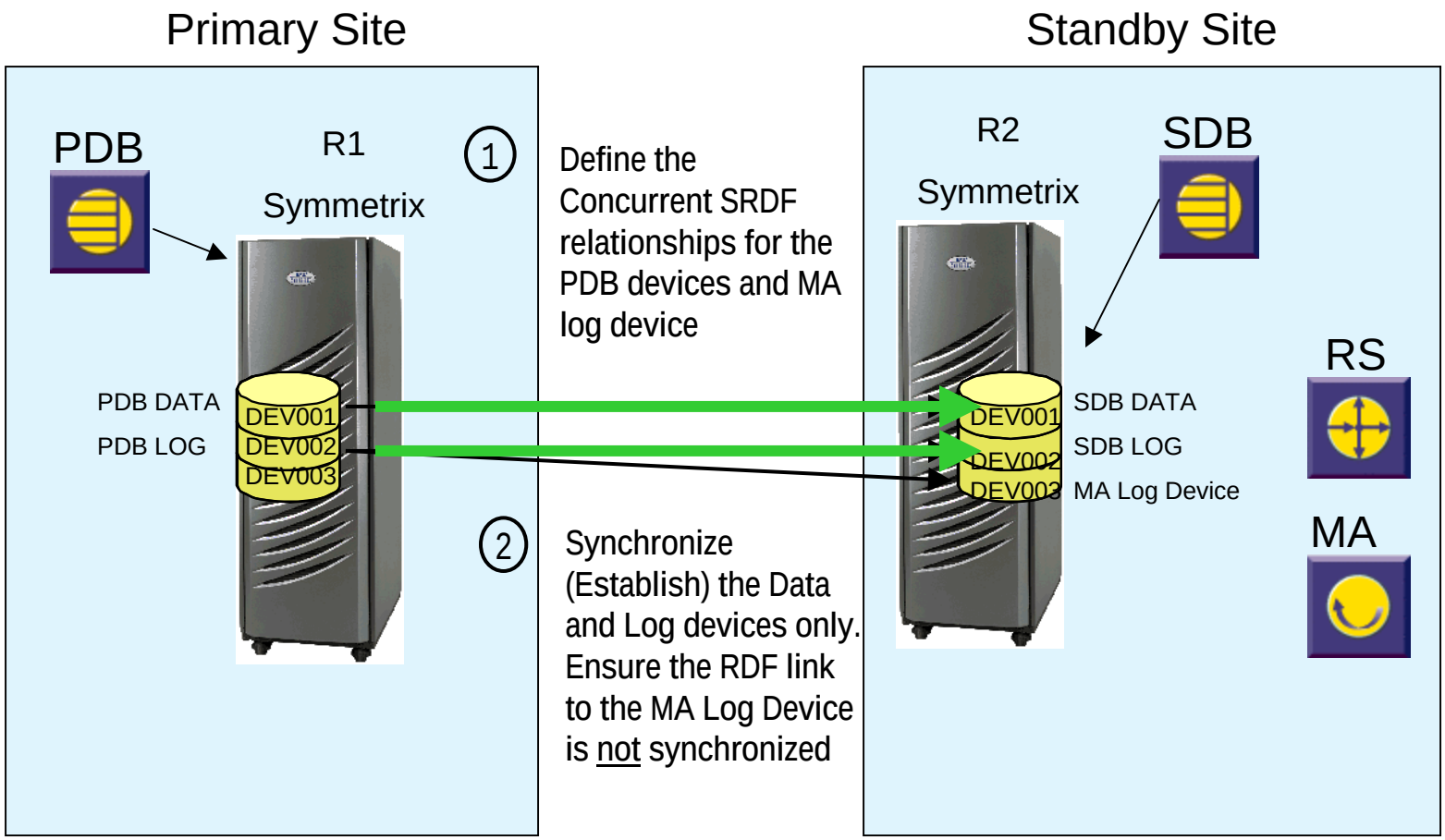

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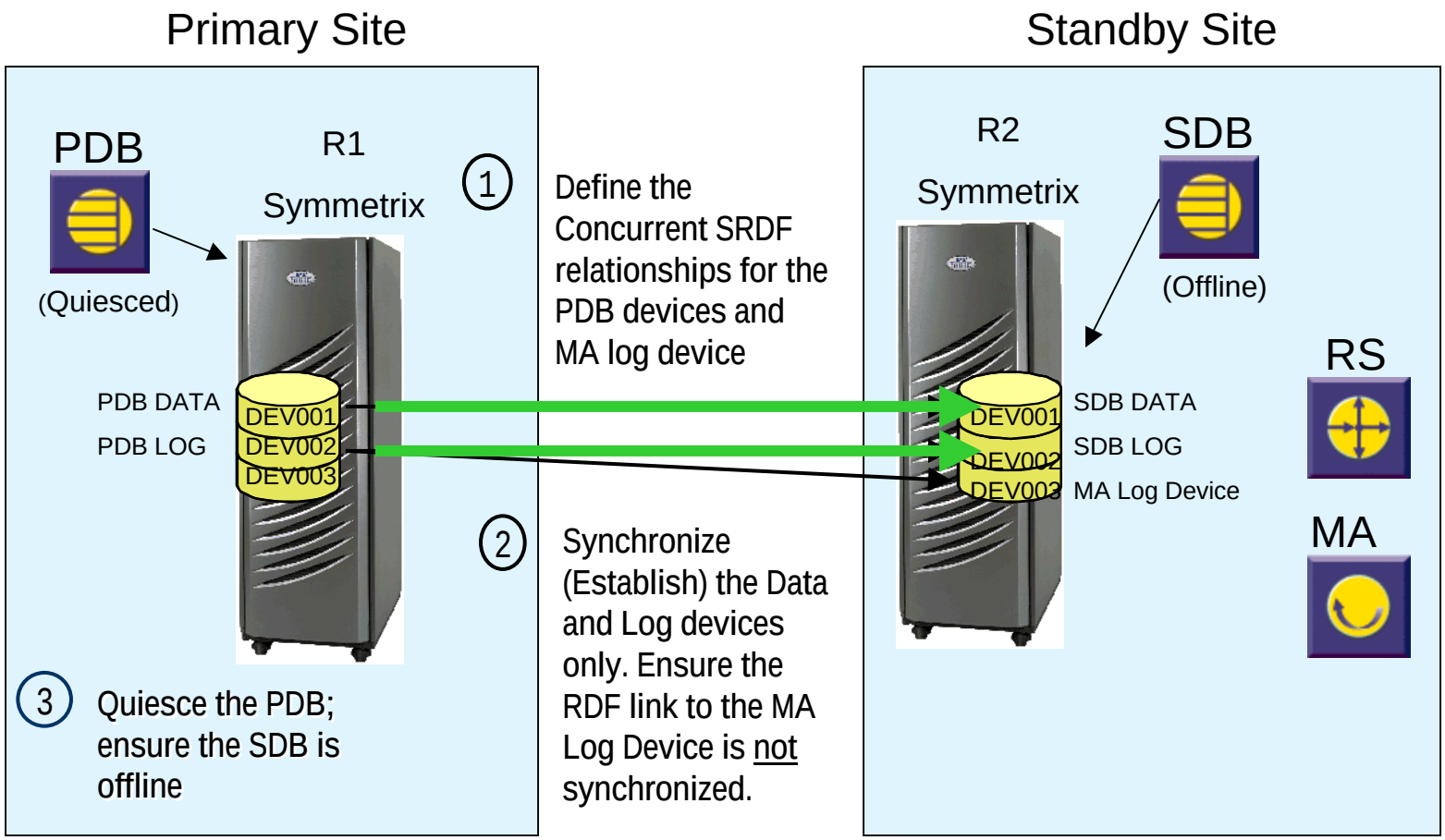

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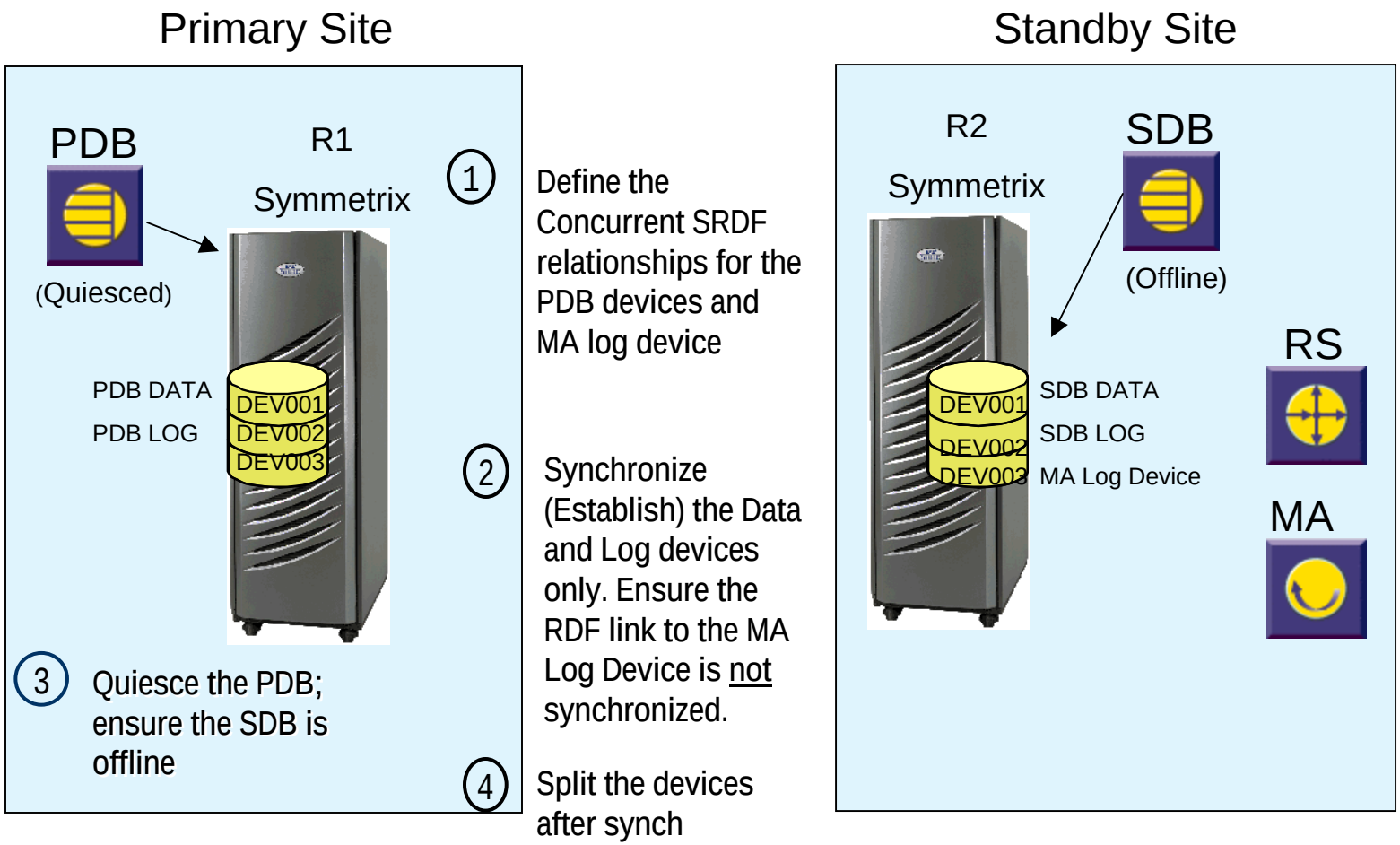

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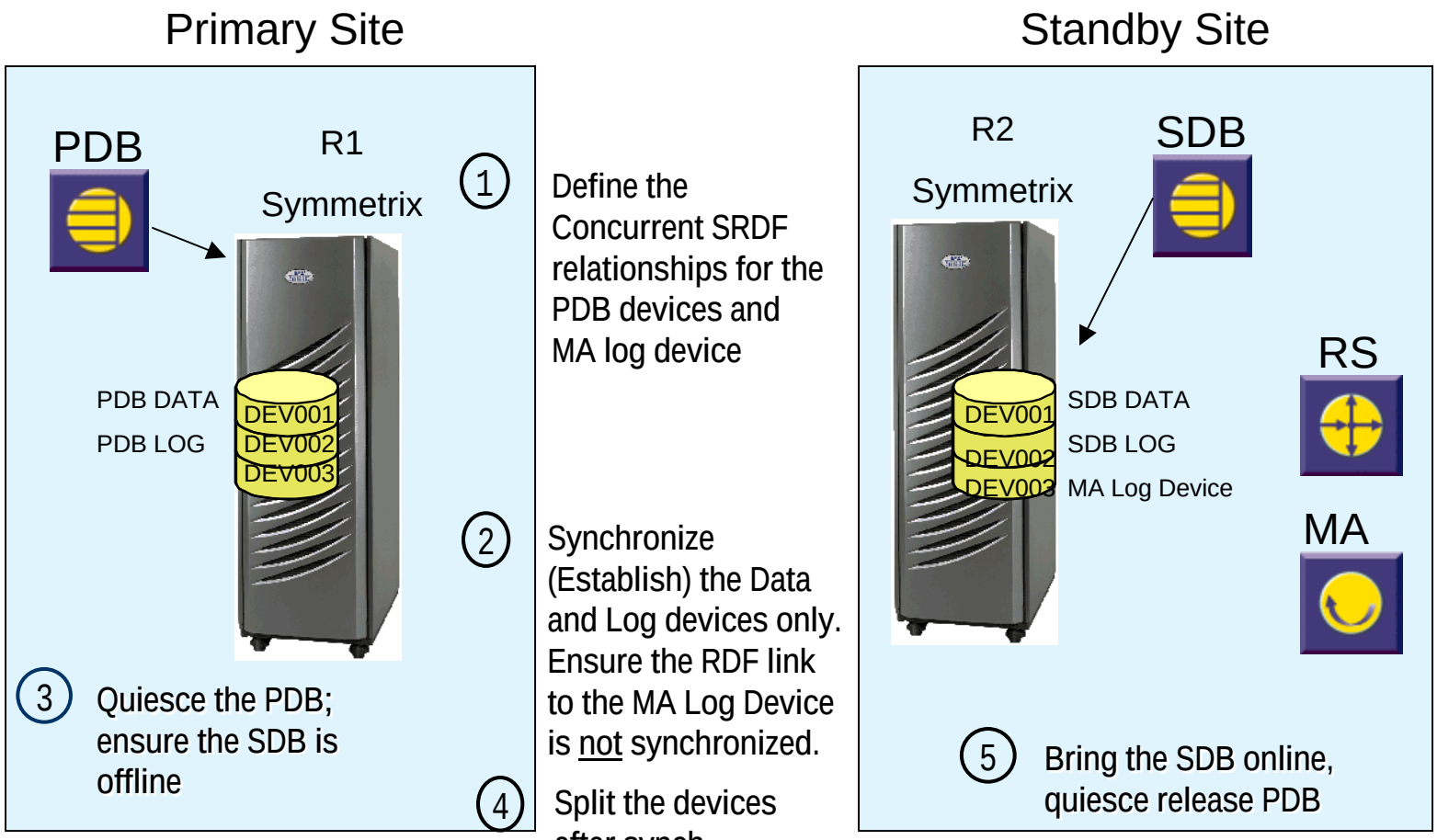
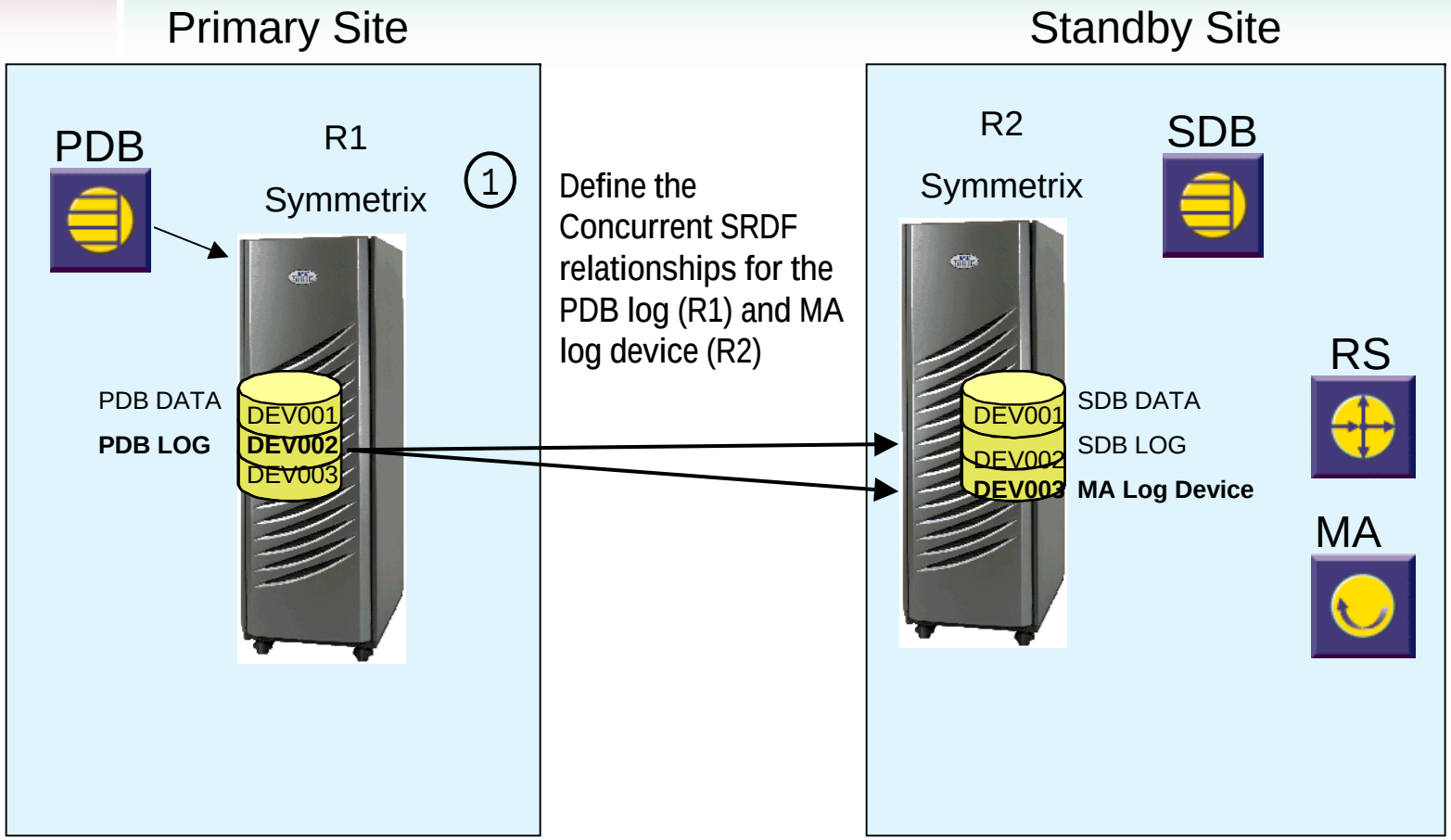


Sybase Mirror Activator –
Replication via Concurrent SRDF



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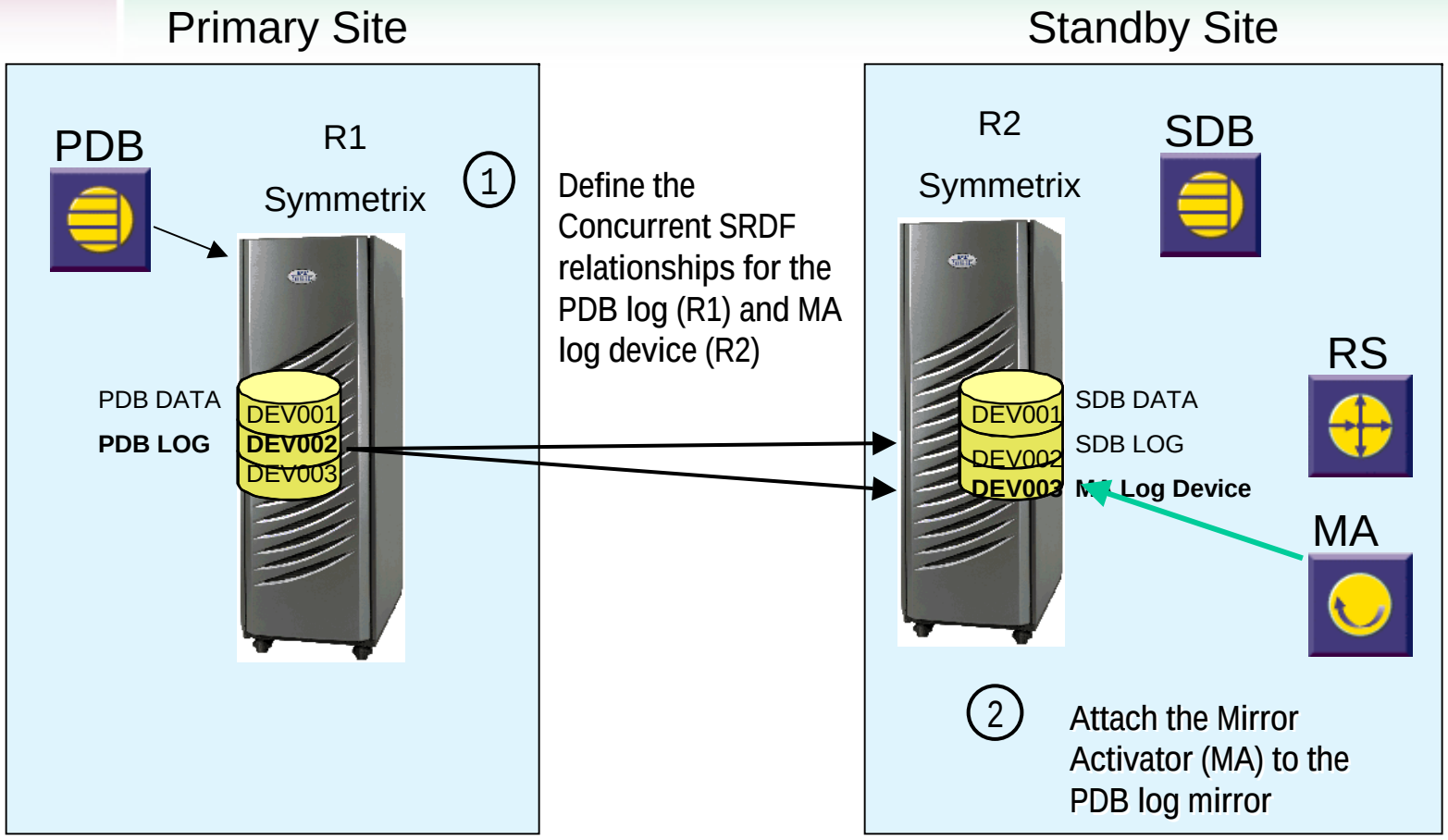

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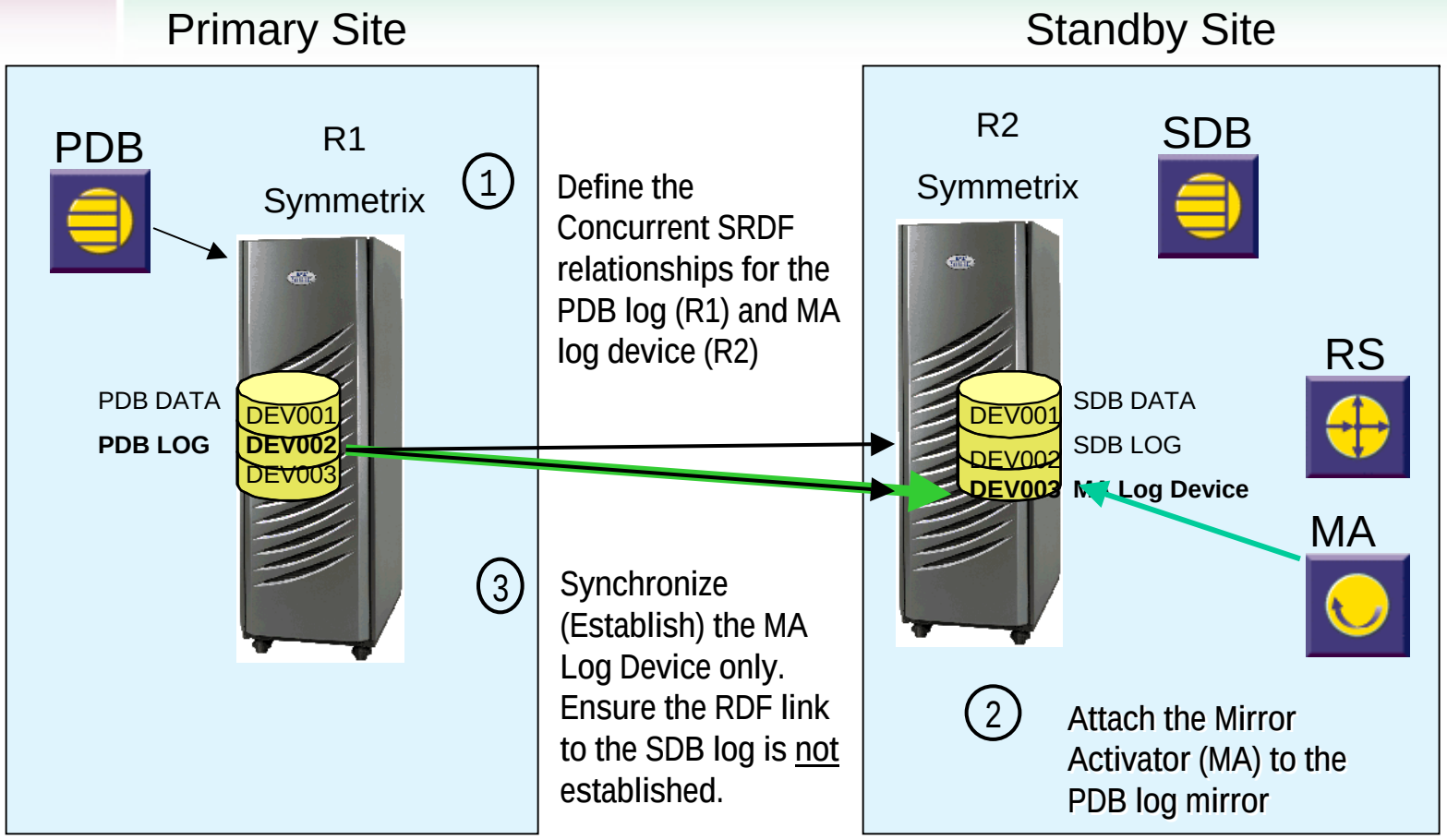

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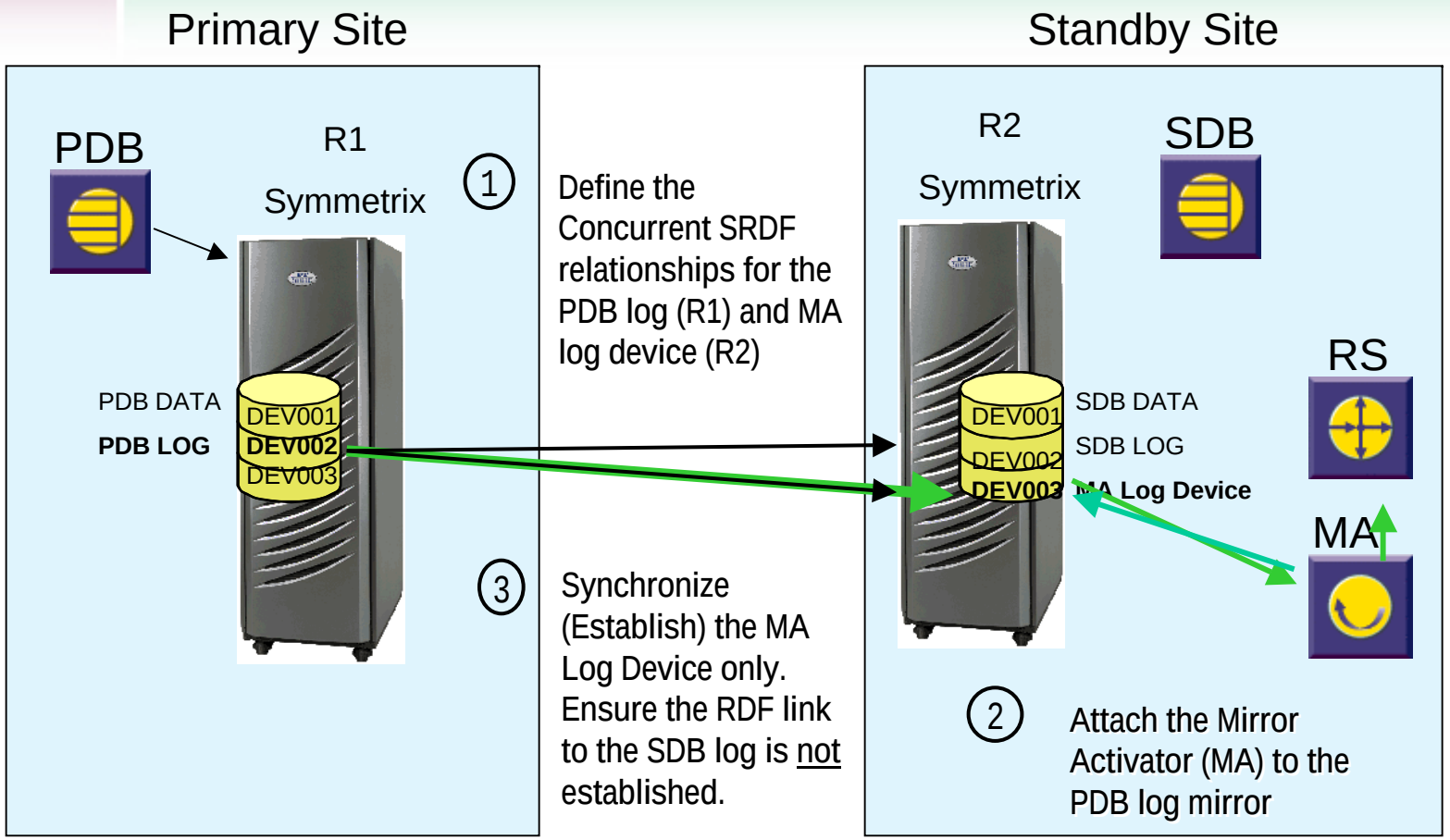

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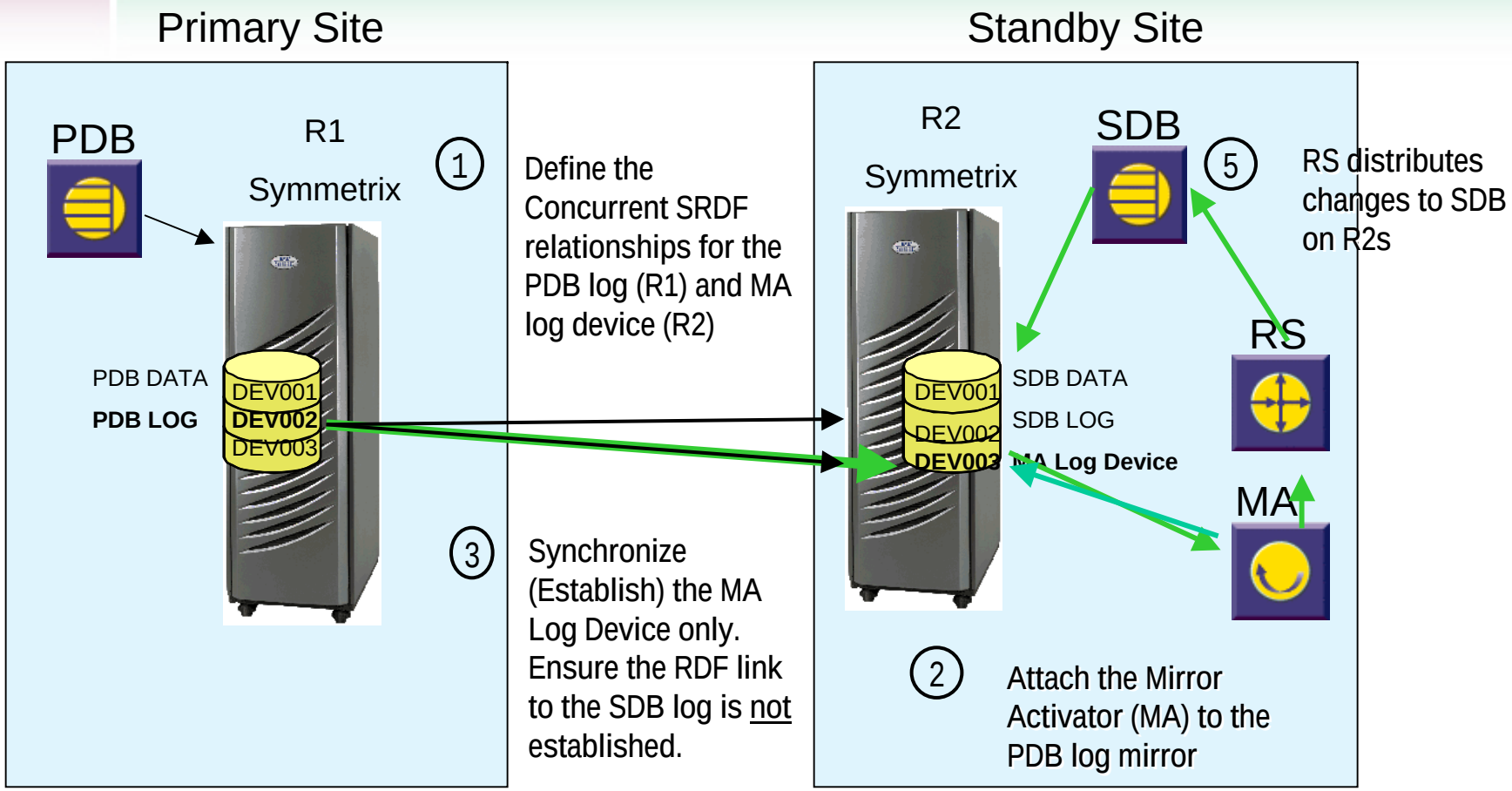
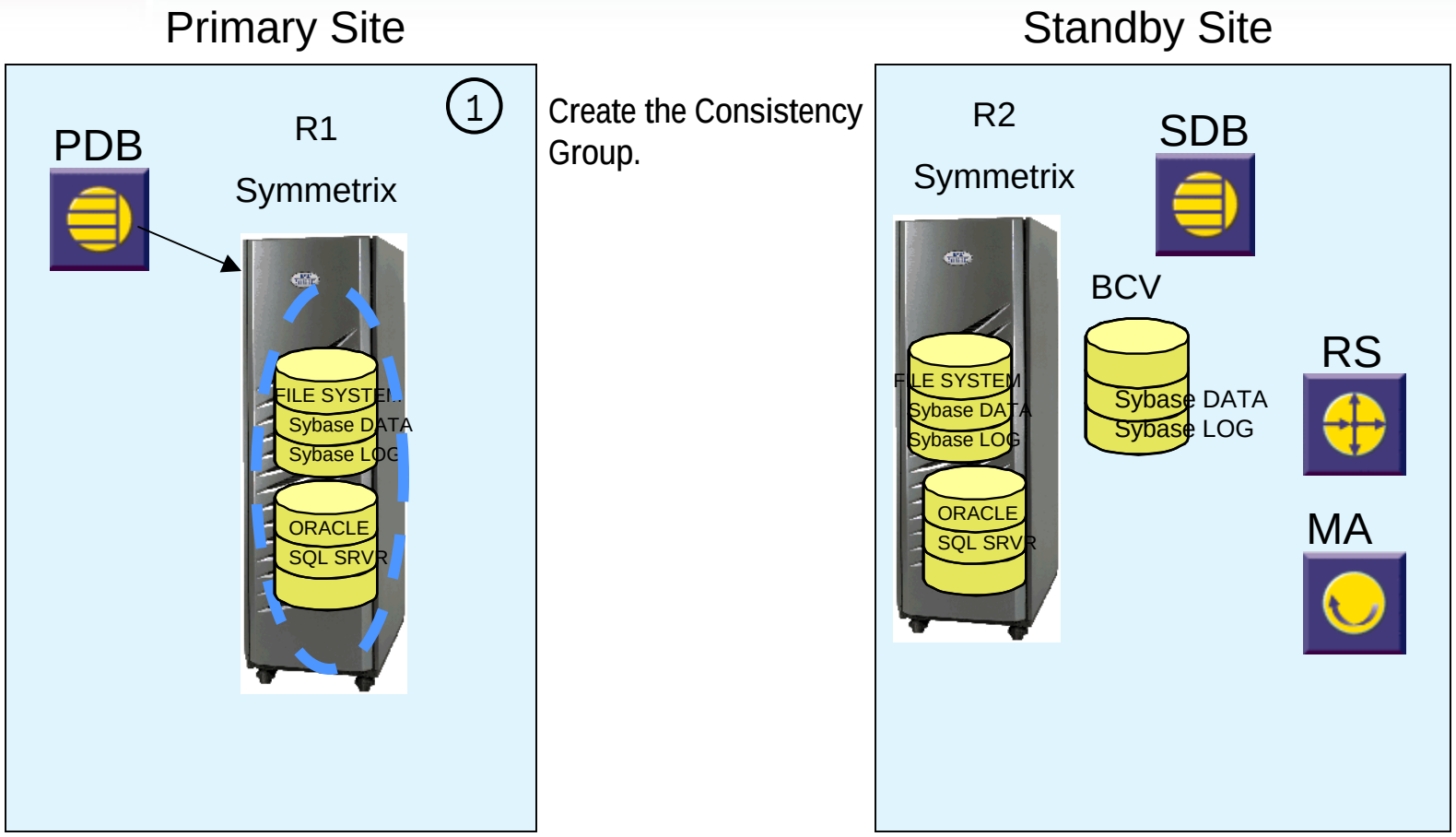


Sybase Mirror Activator –
Materialization for Consistency Groups



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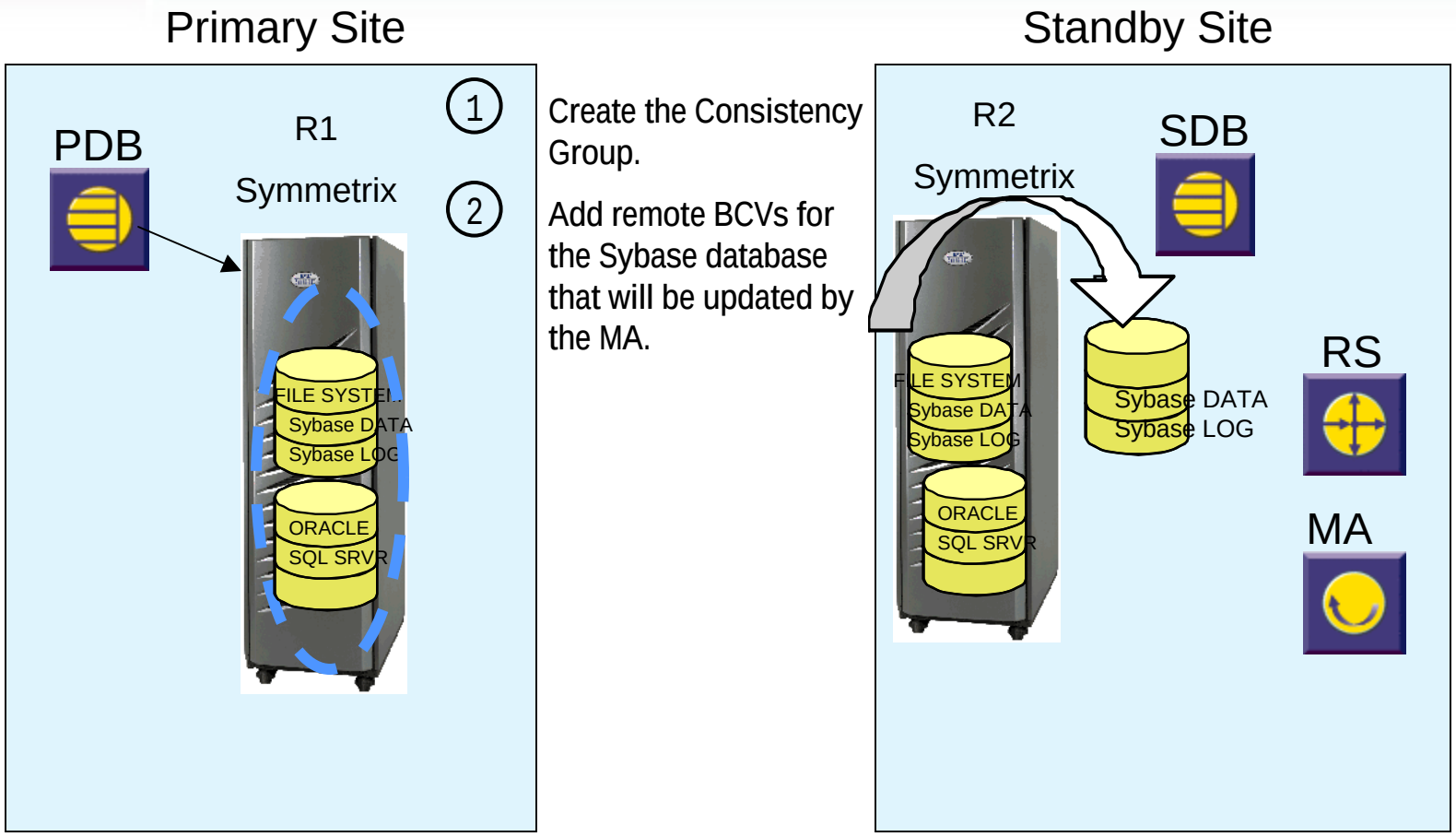

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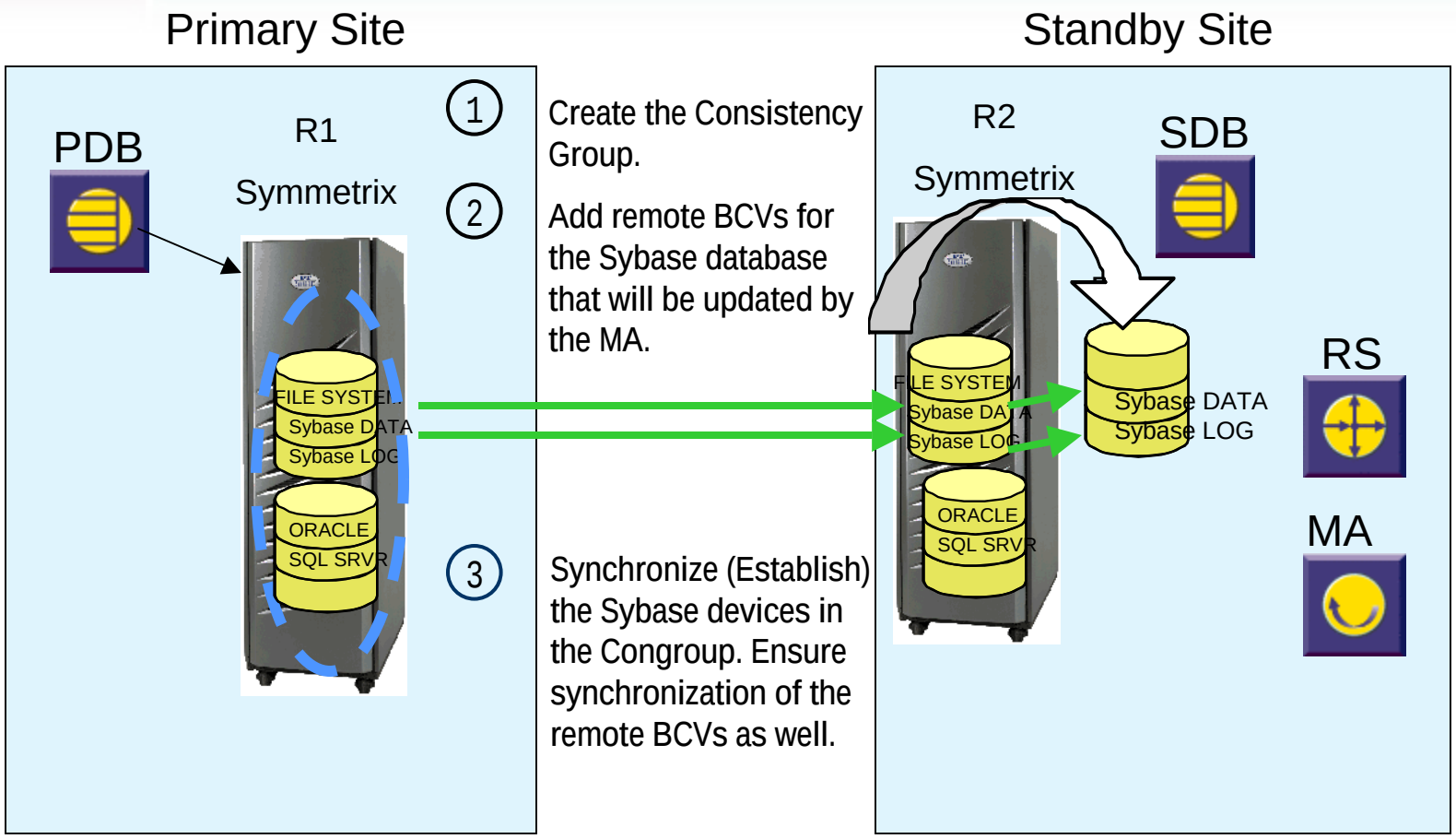

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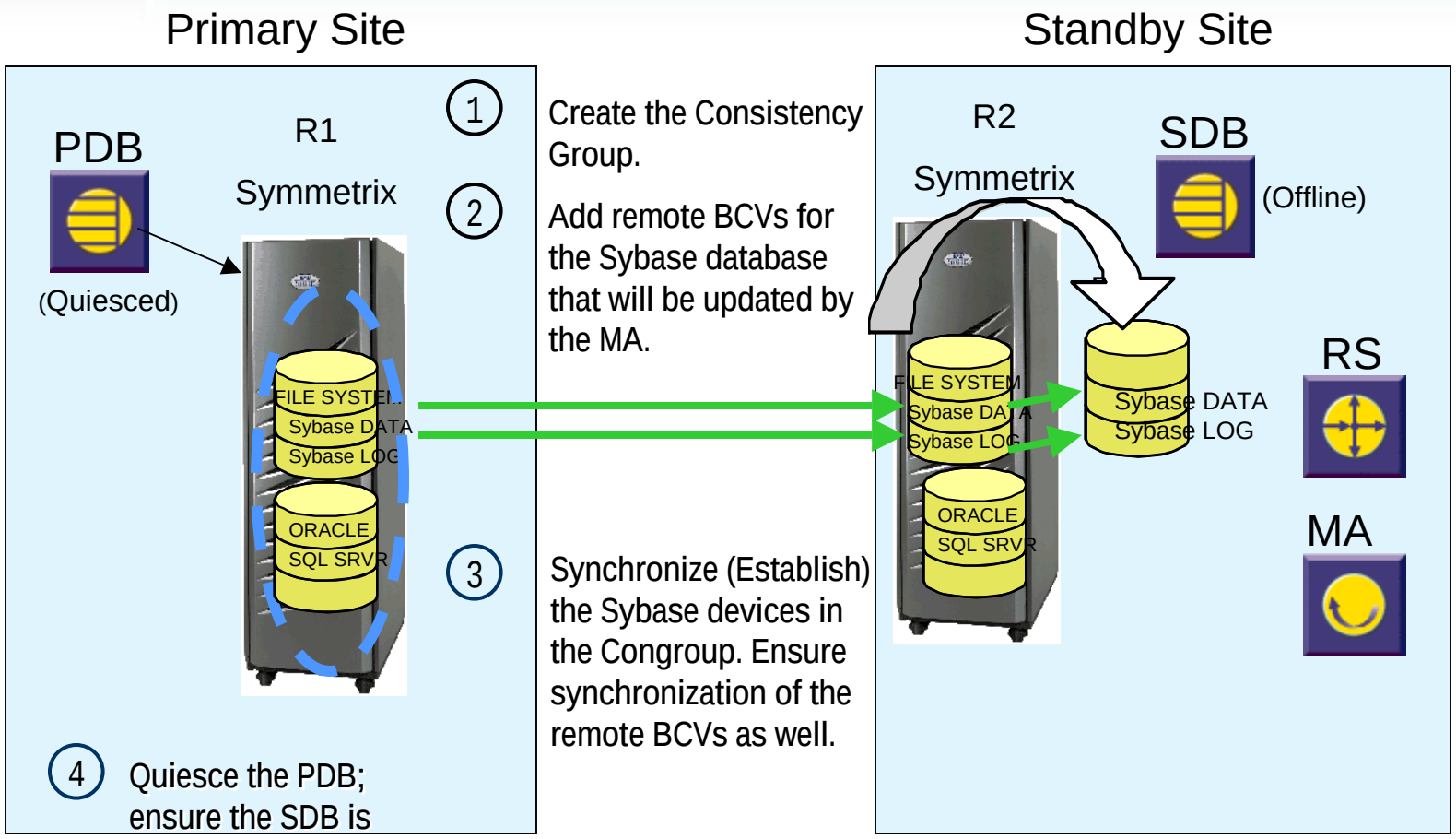

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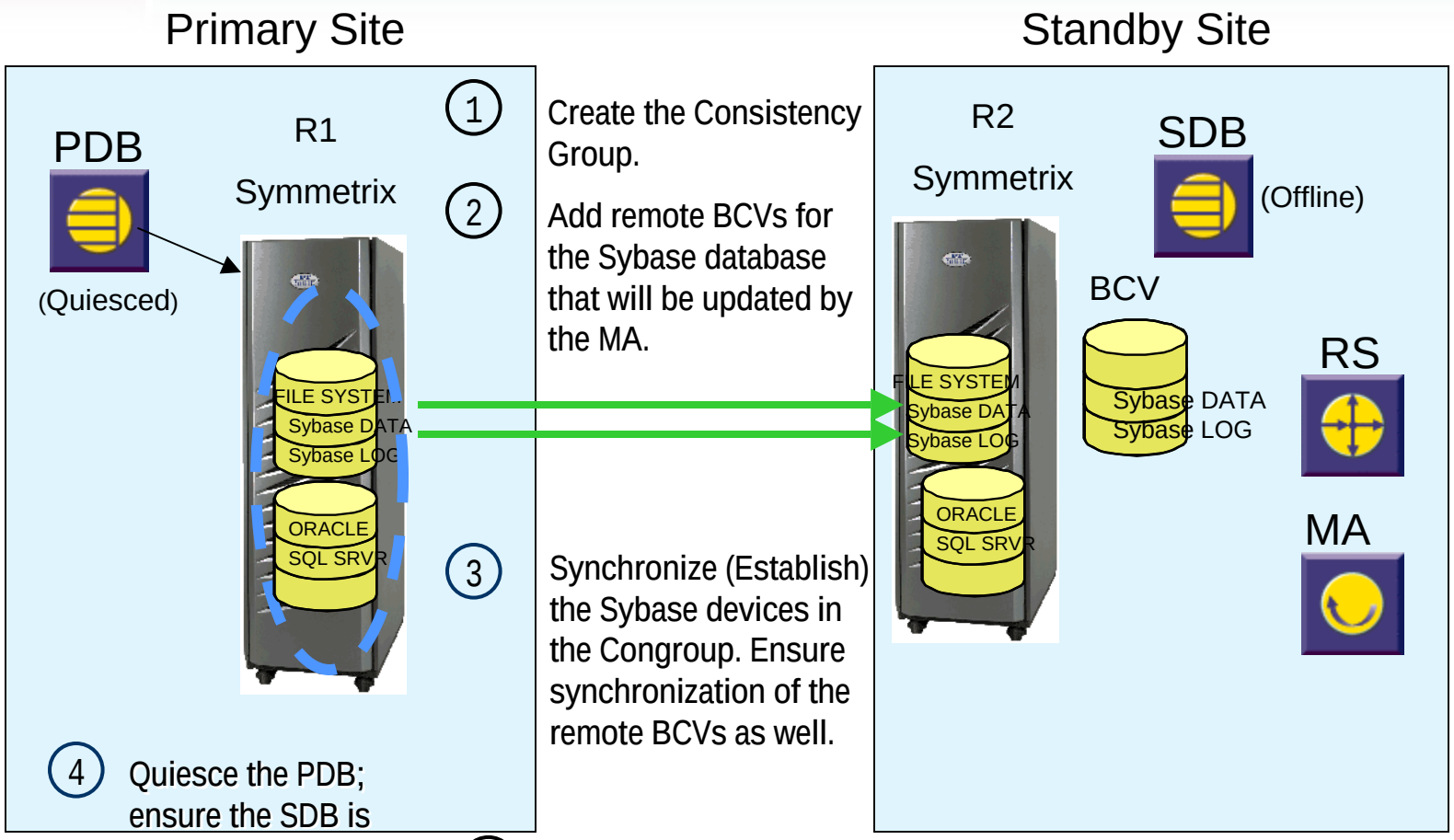

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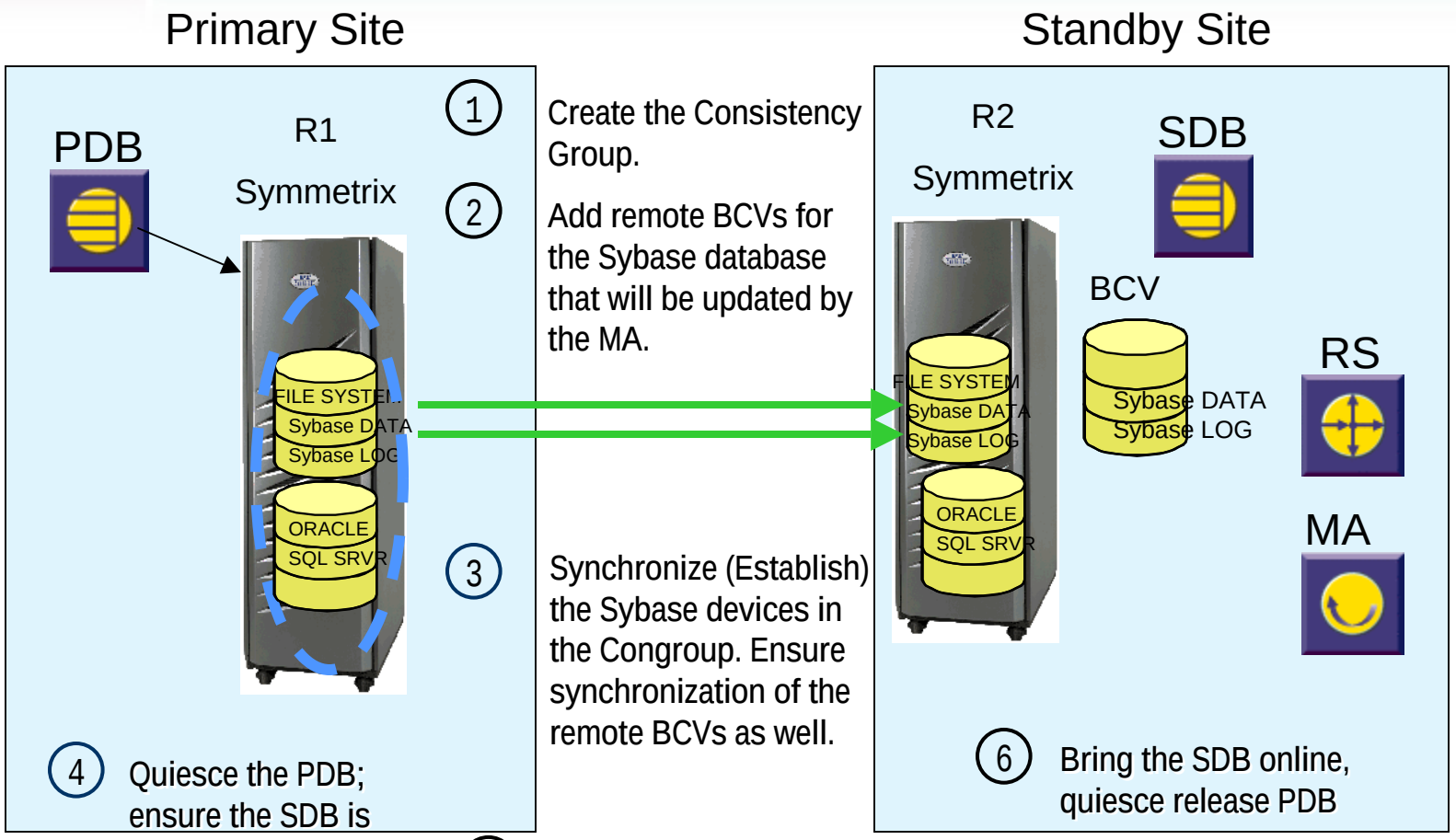
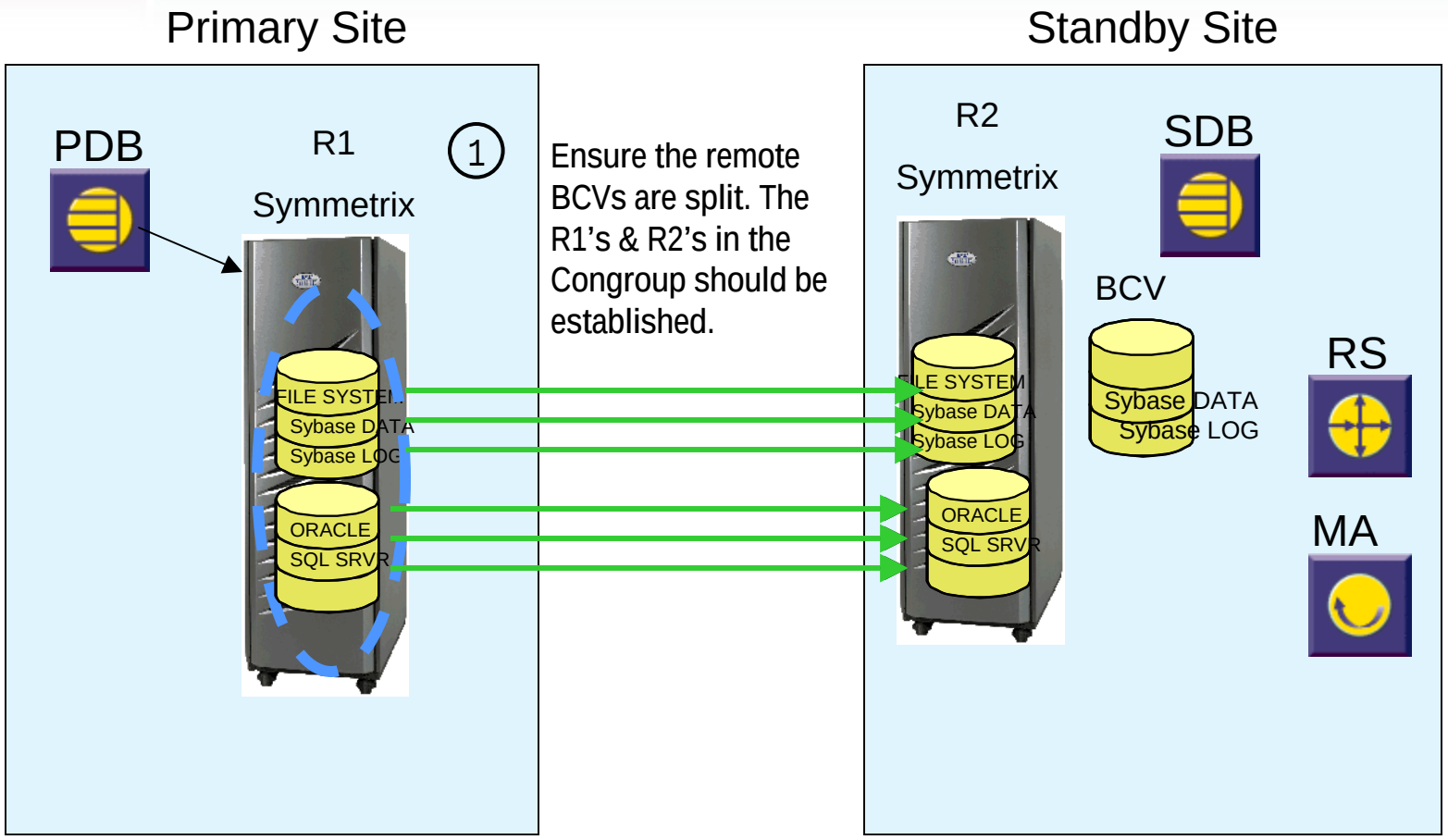


Sybase Mirror Activator –
Replication via Consistency Groups



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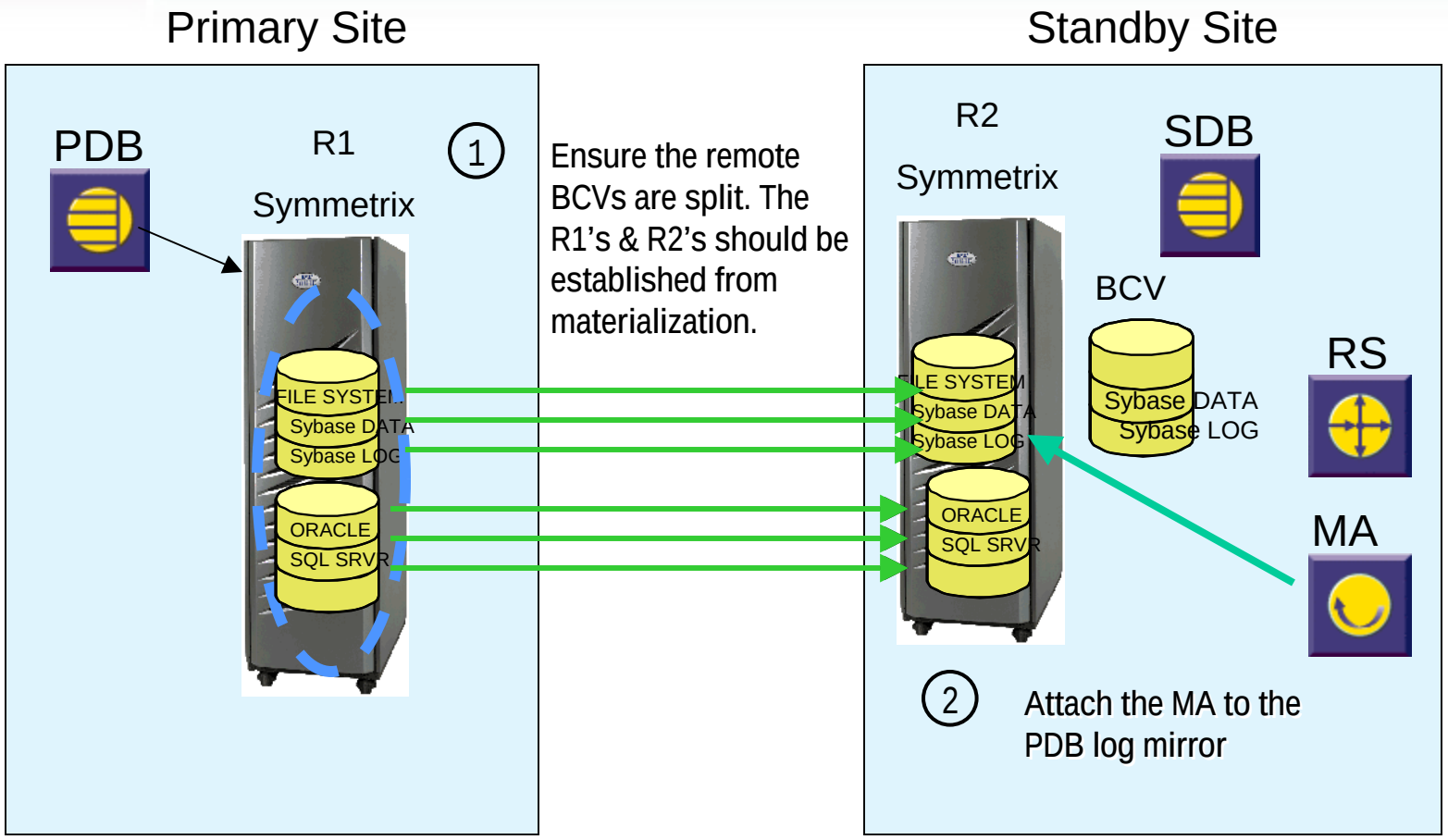

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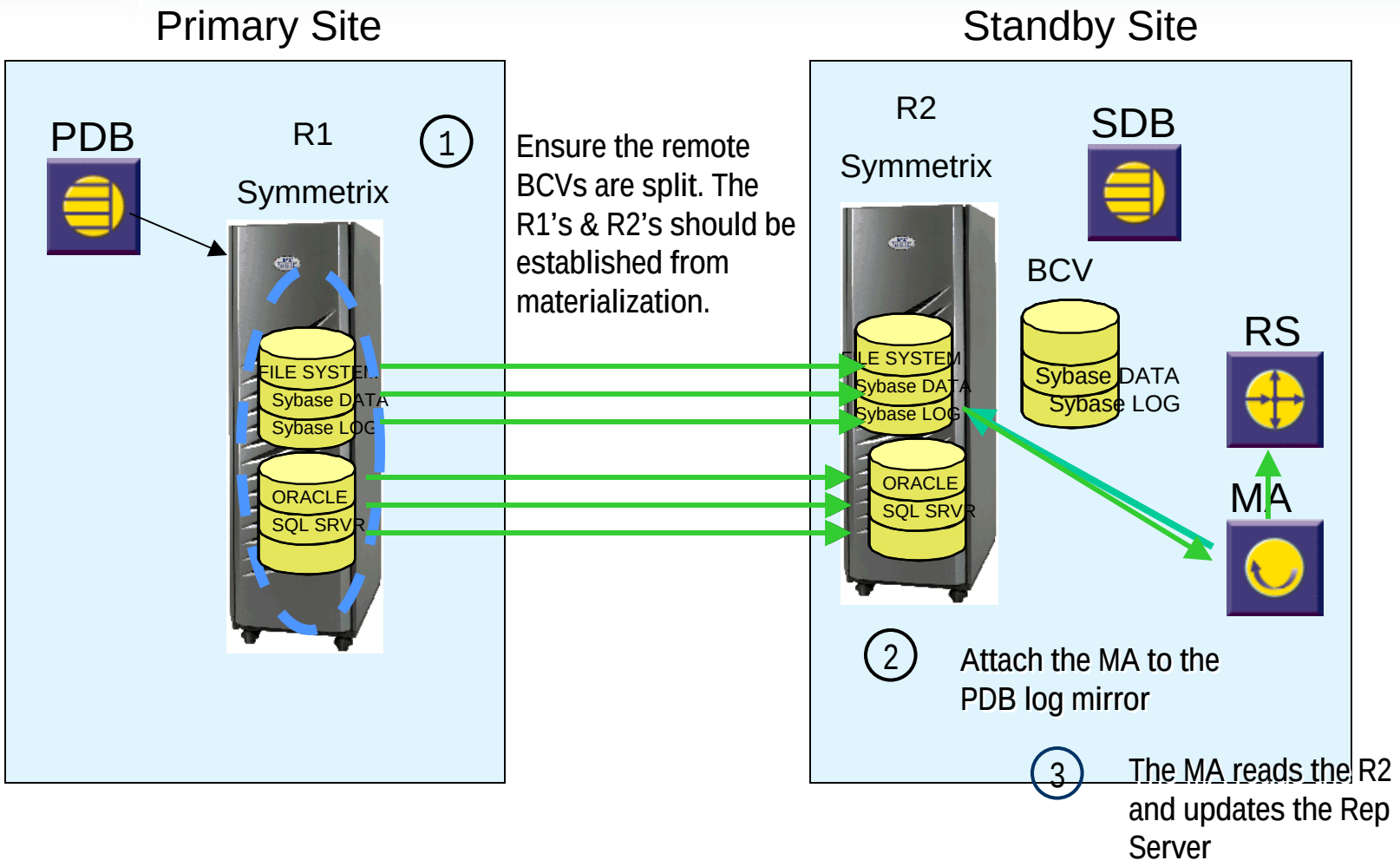

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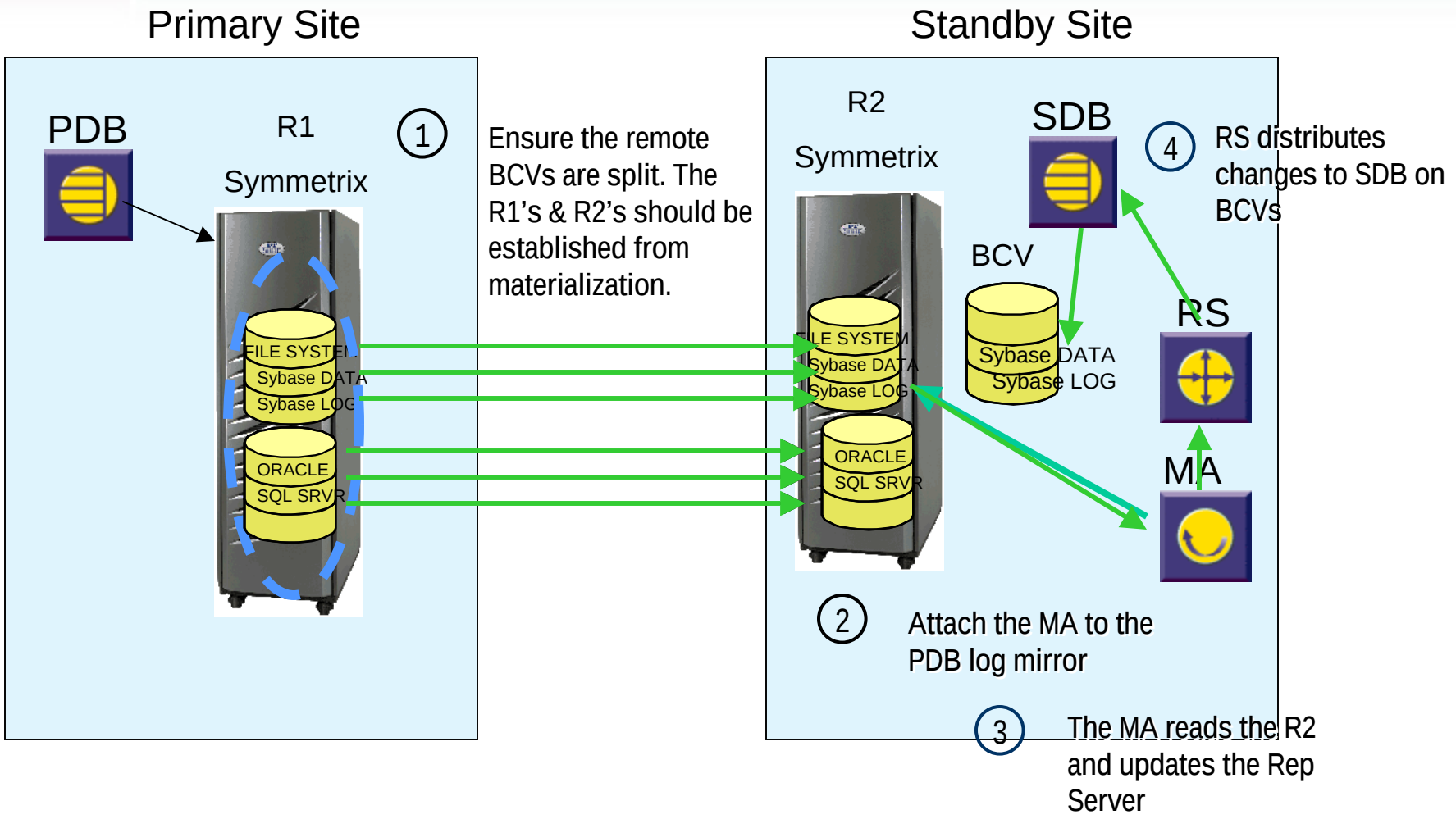

Value Proposition with Concurrent SRDF

- **Pros**
  - Zero data loss solution
  - Reduces RTO (recovery time objective) in the event of disaster
  - Reduced bandwidth (due to only replicating the PDB log mirror)
- **Cons**
  - Sybase database cannot be a member of the Consistency Group
  - The failover/failback (also known as “go home”) procedures are complex

Value Proposition with Consistency Groups

- **Pros**
  - Zero data loss solution
  - Allows Sybase to be included in the Enterprise Consistency Group
  - Provides an independent BCV copy of the database that can be used for reporting, queries, analytics and dbcc's without impacting production **or** the DR copy
  - Failover/failback ("go home") procedures are simplistic and part of the basic SRDF feature set
- **Cons**
  - Requires more bandwidth and storage

Summary

- Mirror Activator with SRDF/S extends the value of your current investment in hardware/software by allowing you to utilize resources at the target site
- Weigh the pros and cons to decide which is the best implementation for your current environment
- See the “Sybase Solutions Guide” on EMC.com and/or white paper titled “Sybase Mirror Activator with EMC Symmetrix Remote Data Facility” on Sybase.com