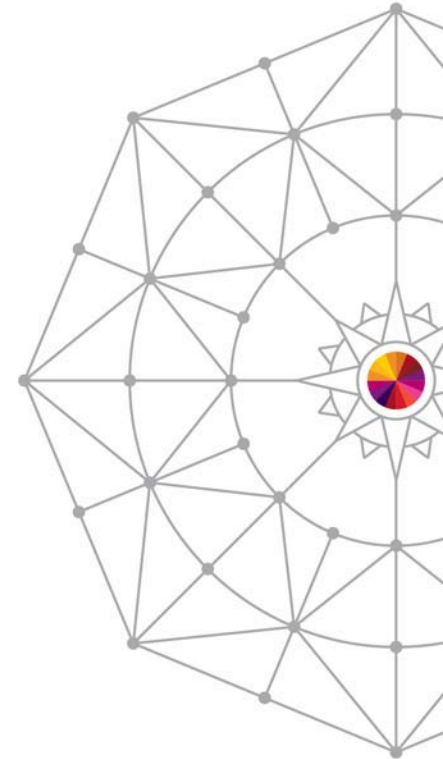# Local and Remote Replication Solutions from IBM, EMC, and HDS
Session 16057 SHARE Pittsburgh
August 6, 2014

Brett Quinn
Tony Negro
*EMC Corporation*

EMC Local Replication offerings

- TimeFinder / Clone
  - Up to16 High-performance physical copies
  - Full-volume (w/precopy) and dataset level
  - Incremental resync (Dataset and Multi-volume)
  - Consistency group support (**dataset and volume!**)
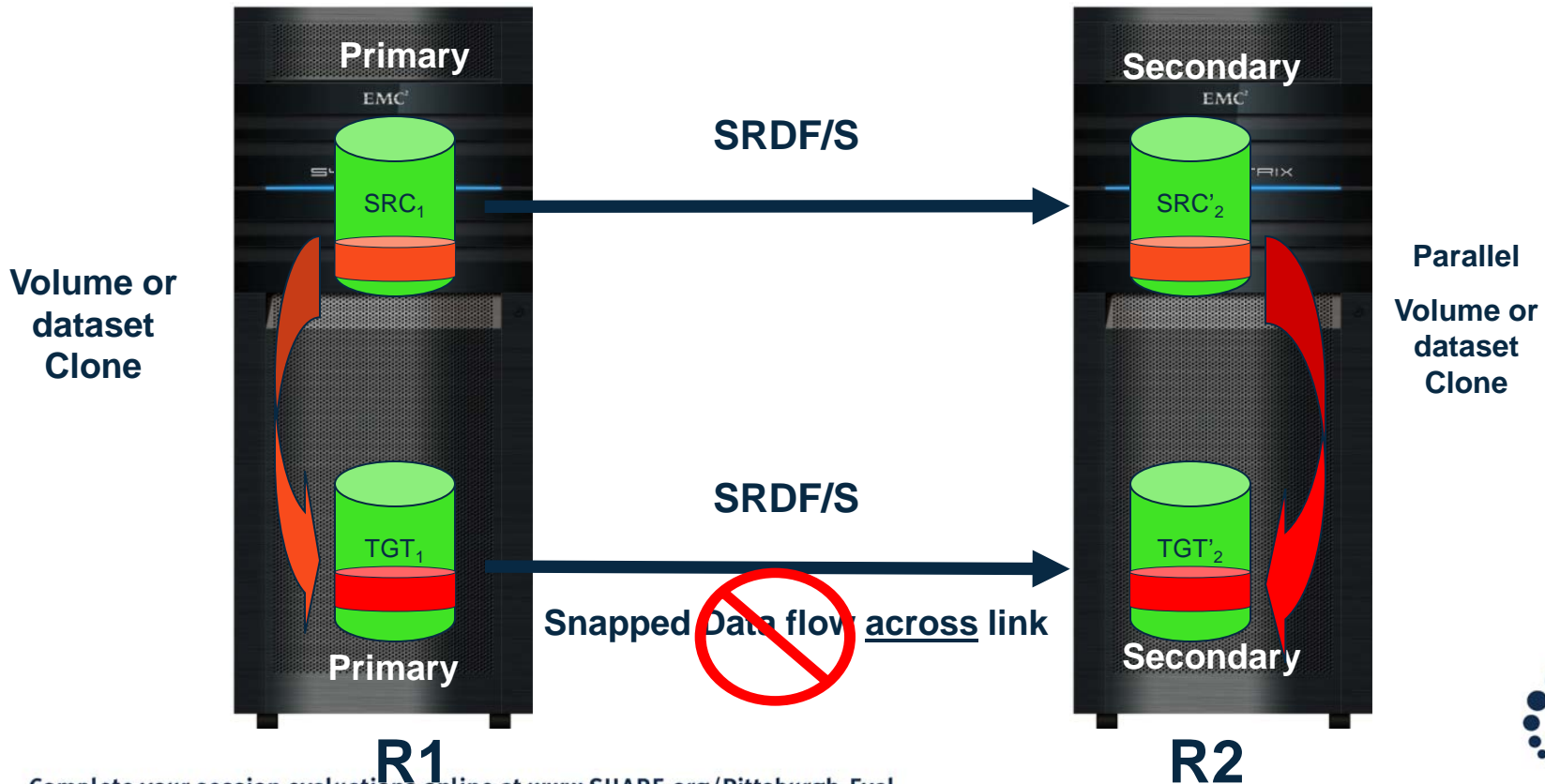 - Support for TF/Mirror syntax
- TimeFinder / Snap
  - Space-saving volume snapshot images (up to 128)
  - Typically requires less than 30% additional capacity
  - Async COFW, Dynamic SAVEPOOL expansion
  - Incremental resync
  - Consistency group support

Production

Clones

Snaps
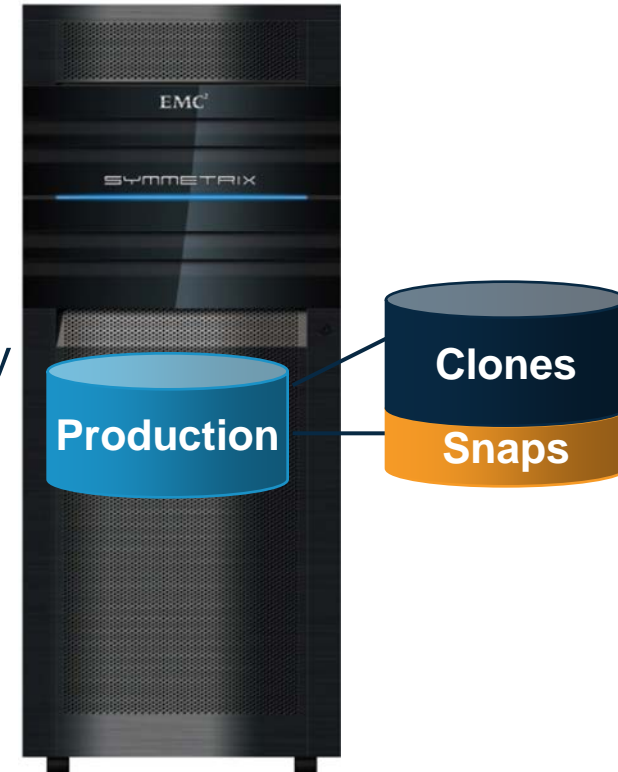
Simultaneous TF/Clone

- SNAP VOLUME or SNAP DATASET operations to SRDF/S R1 volumes result in <u>independent simultaneous snap operations</u> in the R2 Symmetrix

- Data state for snapped data is the same on both sides

Primary

EMC²

SRC$_1$

SRDF/S

Secondary

EMC²

SRC'$_2$

Volume or dataset Clone

Parallel

Volume or dataset Clone

SRDF/S

TGT$_1$

TGT'$_2$

Snapped Data flow <u>across</u> link

Primary

Secondary

R1

R2

Symmetrix Remote Data Facility:
Two Site solutions

SRDF/Synchronous
- Based on RAID-1 mirroring
- No data loss
- One round trip per I/O
- Supports Autoswap

Primary **Secondary**

Limited Distance

R1   R2

SRDF/Asynchronous
- Predictable RPO
- No performance impact
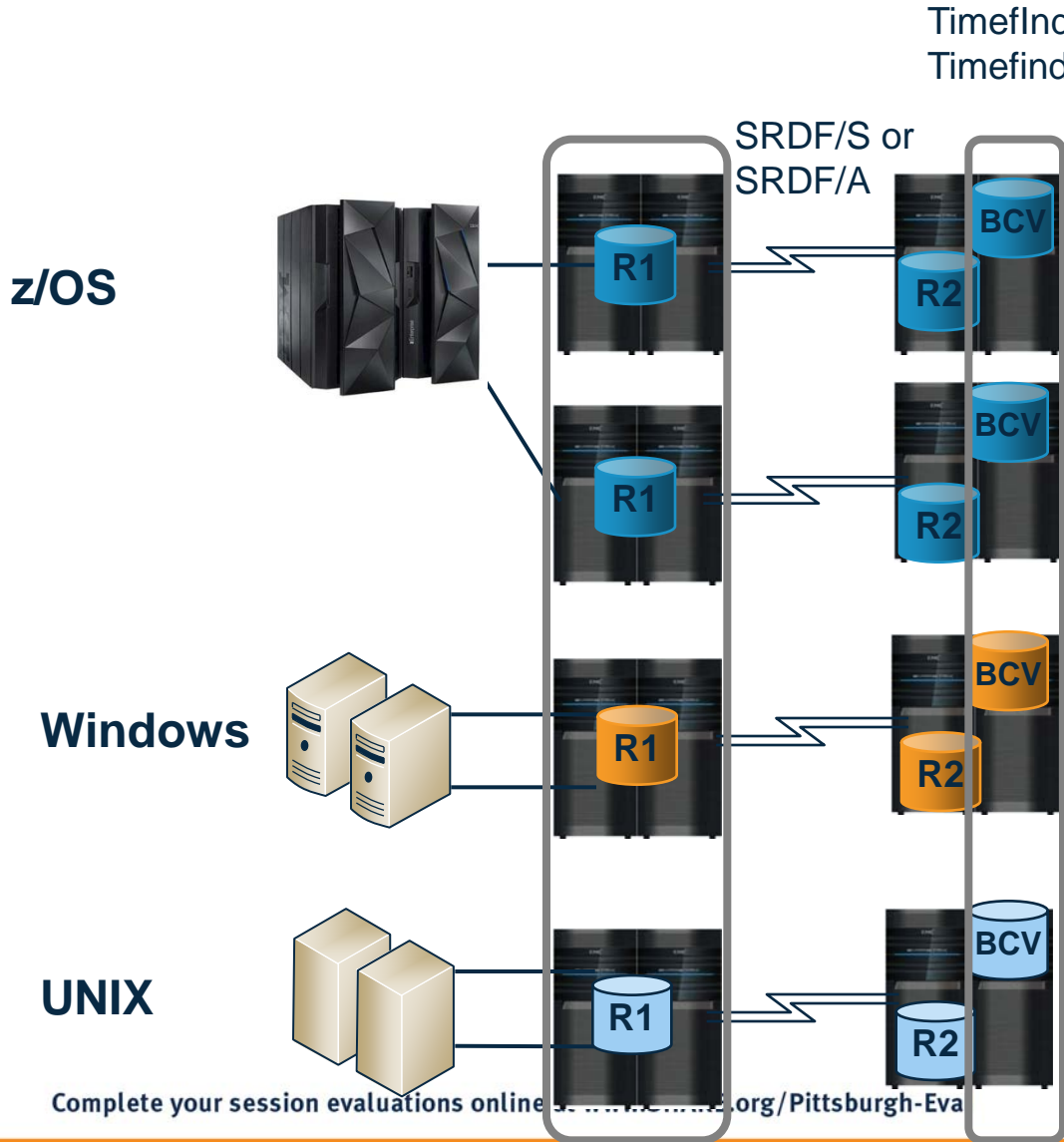- Unlimited distance
- **Only two copies of data required**

Primary **Secondary**

Unlimited Distance

R1   R2

SRDF/DM
- Data Movement solution
- No performance impact
- Unlimited distance

Primary **Secondary**

Unlimited Distance

R1   R2

Complete your session evaluations online at www.SHARE.org/Pittsburgh-Eval

Enterprise-wide Consistency with SRDF and TimeFinder Consistency Groups

TimefInder/Clone
Timefinder/Snap

SRDF/S or
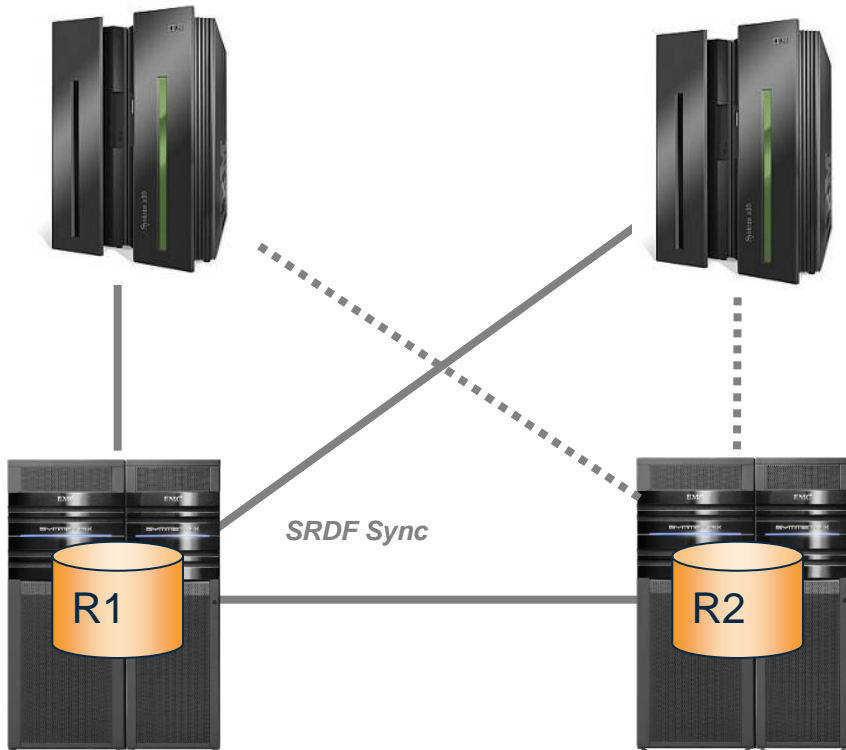SRDF/A

z/OS

BCV

R1 — R2

BCV

R1 — R2

Ensuring enterprise-wide consistency across multiple databases, applications, and platforms

Product-based consistency function
-Not automation driven
-Single command

Windows

BCV

R1 — R2

UNIX

BCV

R1 — R2

Complete your session evaluations online at ......org/Pittsburgh-Eva

SHARE
in Pittsburgh 2014

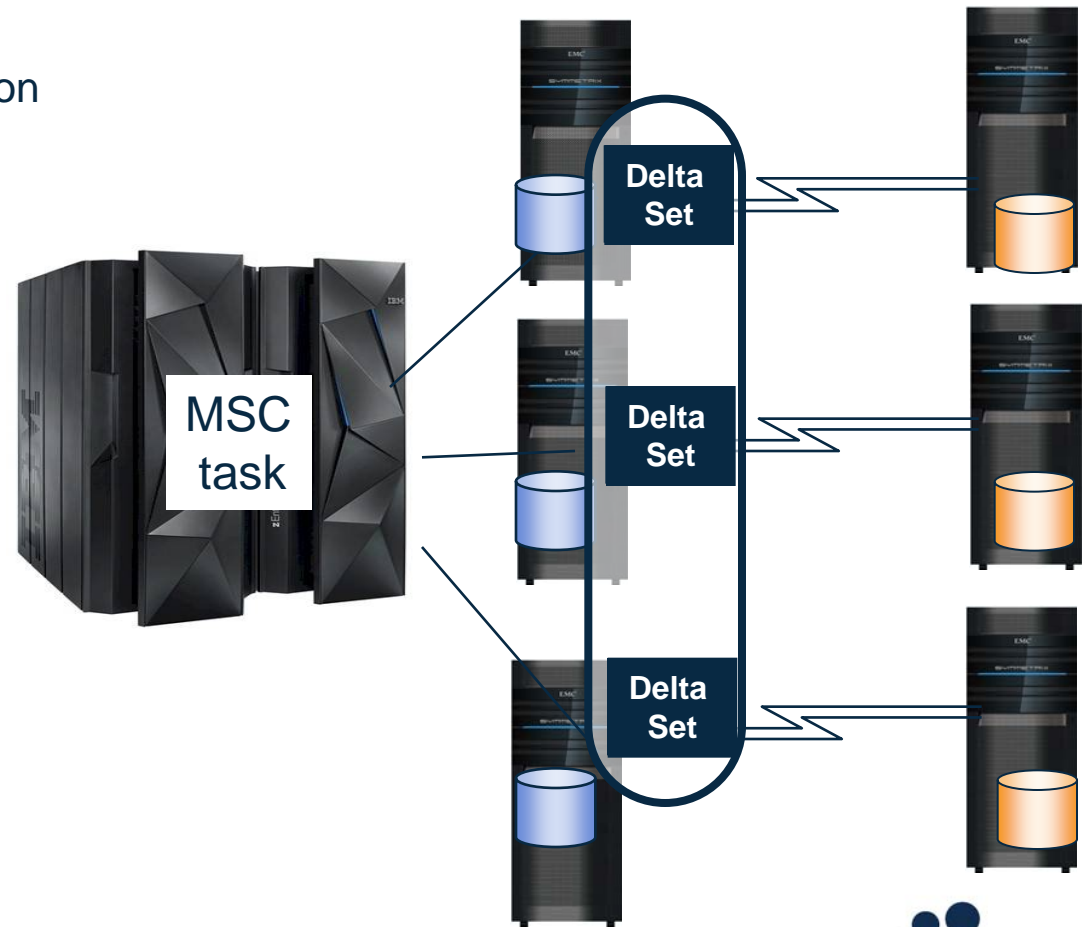# AutoSwap

Before Swap

After Swap

SRDF Sync

R1

R2

R2
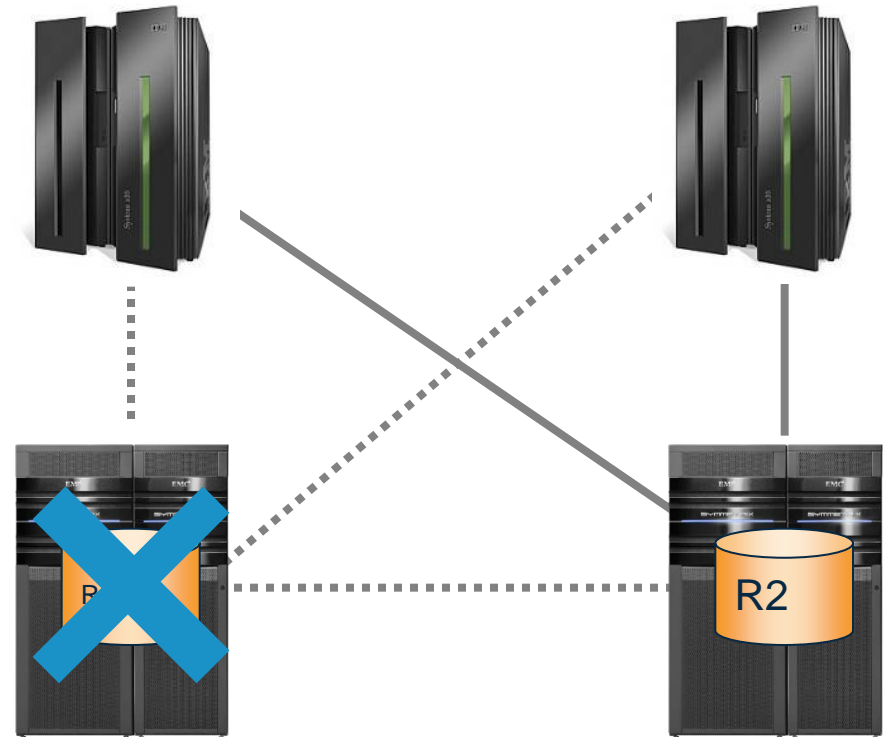
SRDF/A
Multi-Session Consistency

- SRDF/A groups that span Symmetrix systems
  - Used when related data resides on more than one system
- The SRDF/A MSC group is acted upon as a single entity
  - Ensures a complete, restartable point in time remote copy
  - Supports mixed Unix, Windows, MF devices in a single group

- SRDF/A Automated Recovery
- Dynamic group expansion
- Secondary side Time of Day indication
- 3 second cycle time RPO

MSC task

Delta Set

Delta Set

Delta Set

Complete your session evaluations online at www.SHARE.org/Pittsburgh-Eval
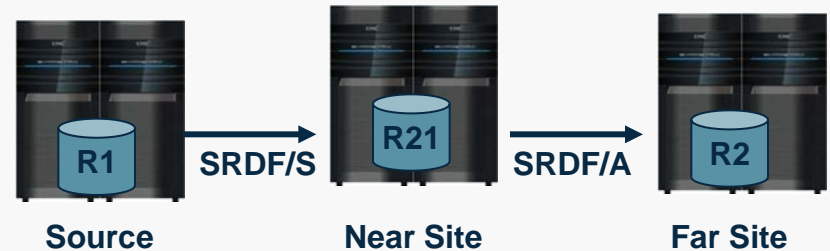
Symmetrix Remote Data Facility:
Three Site solutions

Concurrent SRDF

- Multi-site protection leveraging a single source and concurrently replicating to two remote sites

R11

Source

SRDF/S → **R2** — **Near Site**
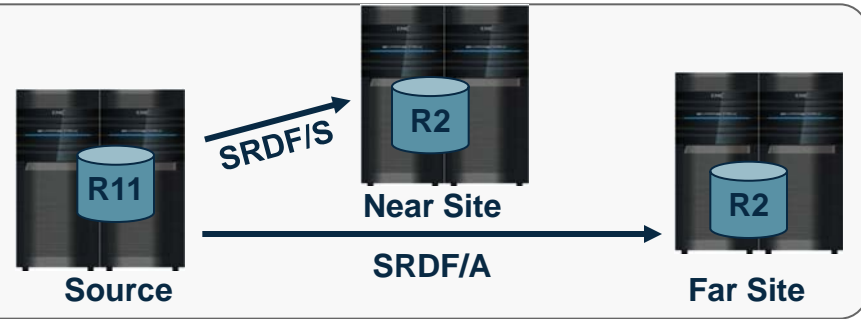
SRDF/A → **R2** — **Far Site**

Cascaded SRDF

- Multi-site protection SRDF/S between Source and Near Site; SRDF/A between Near Site and Far Site
- Eliminates BCV cycling at Near Site; improves RPO/RTO at Far Site

R1 — **Source** → **SRDF/S** → **R21** — **Near Site** → **SRDF/A** → **R2** — **Far Site**

# Symmetrix Remote Data Facility: Three Site solutions

Concurrent SRDF/A

- Multi-site protection leveraging a single source and concurrently replicating to two distant remote sites
- Used for migrations or 'Redundant DR'

SRDF/A

Secondary

OR

R11

Primary

SRDF/A

R2

Secondary

R2

Consistency Group
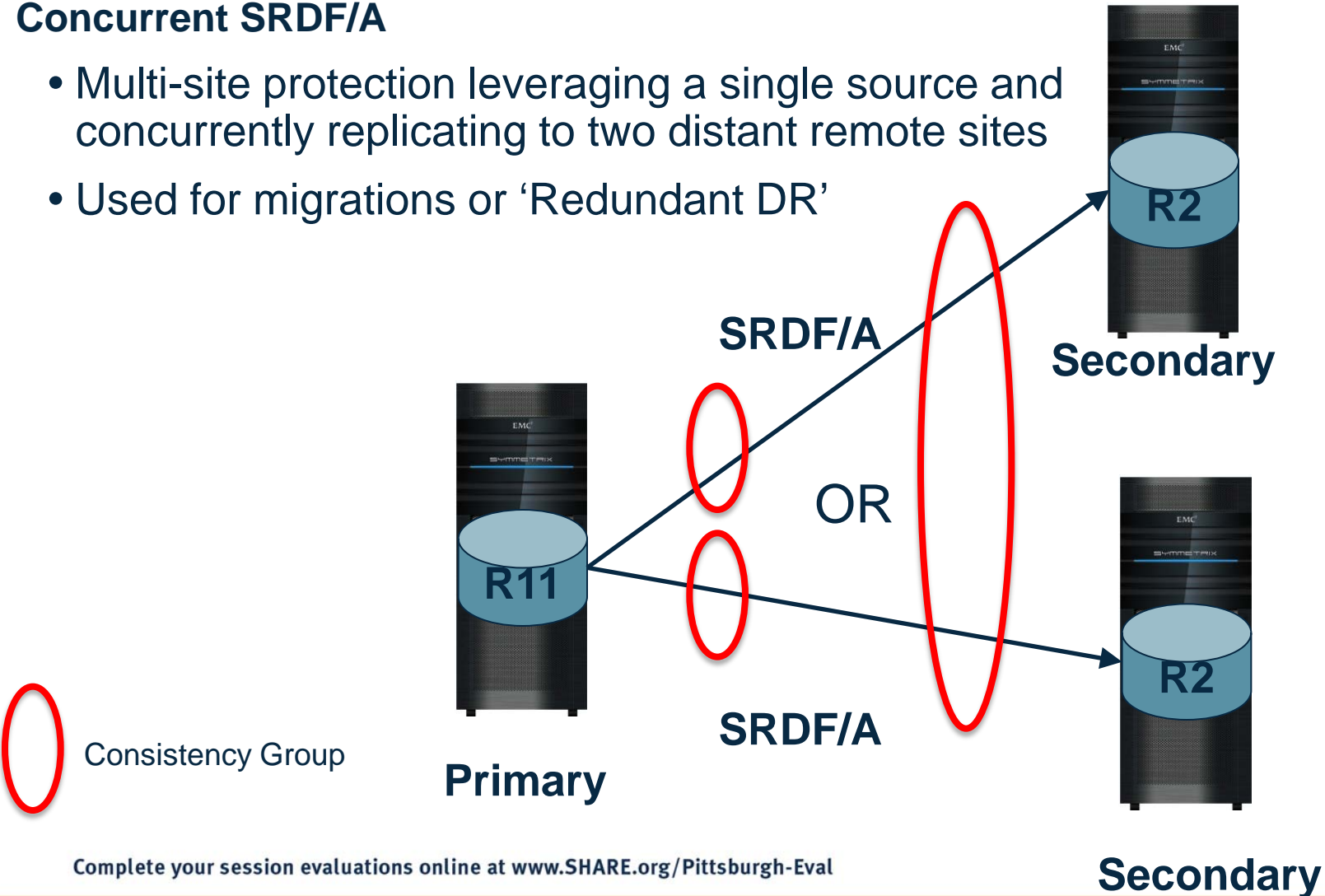
# Symmetrix Remote Data Facility: Three Site Star solutions

SRDF/Star - Concurrent

- Zero data loss recovery
- Includes standby SRDF/A links between remote sites to continue protection if any site fails
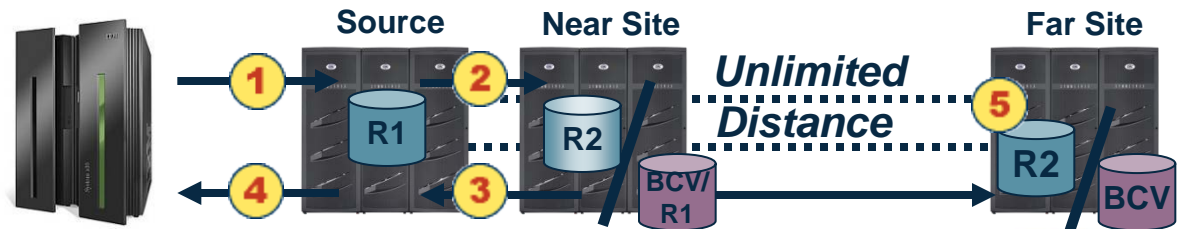- Exploits new R22 device type for improved resiliency
- Requires GDDR
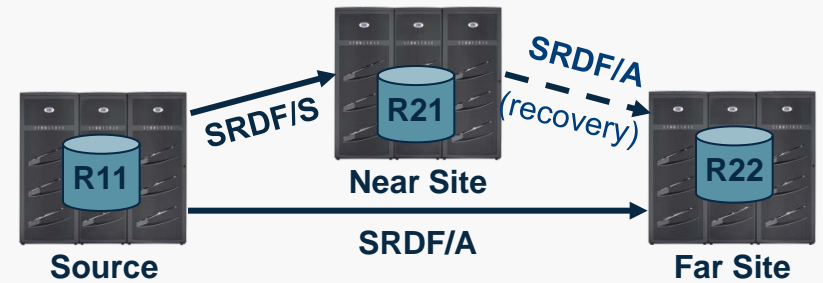
SRDF/Star - Cascaded

- Zero data loss recovery
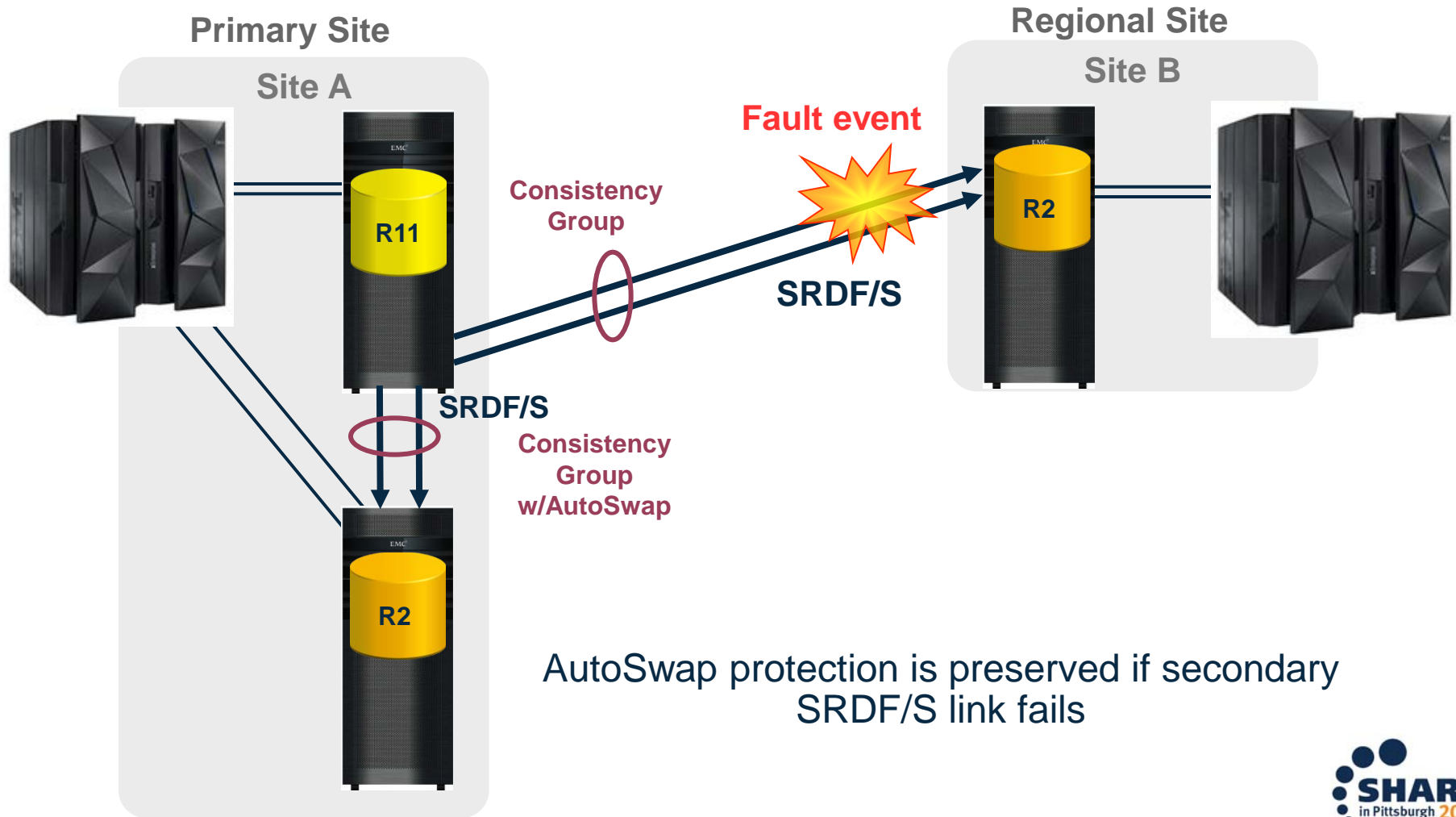- Exploits new R22 device type for improved resiliency
- Requires GDDR
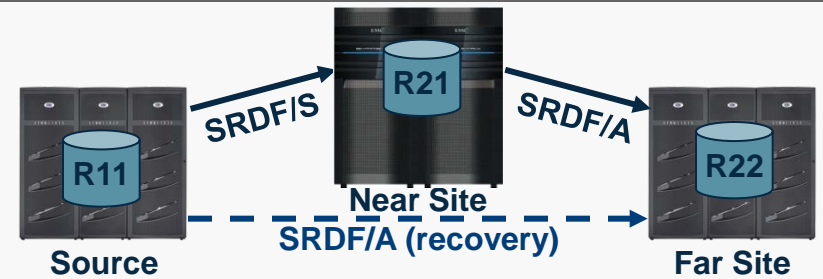
SRDF/AR Automated Replication

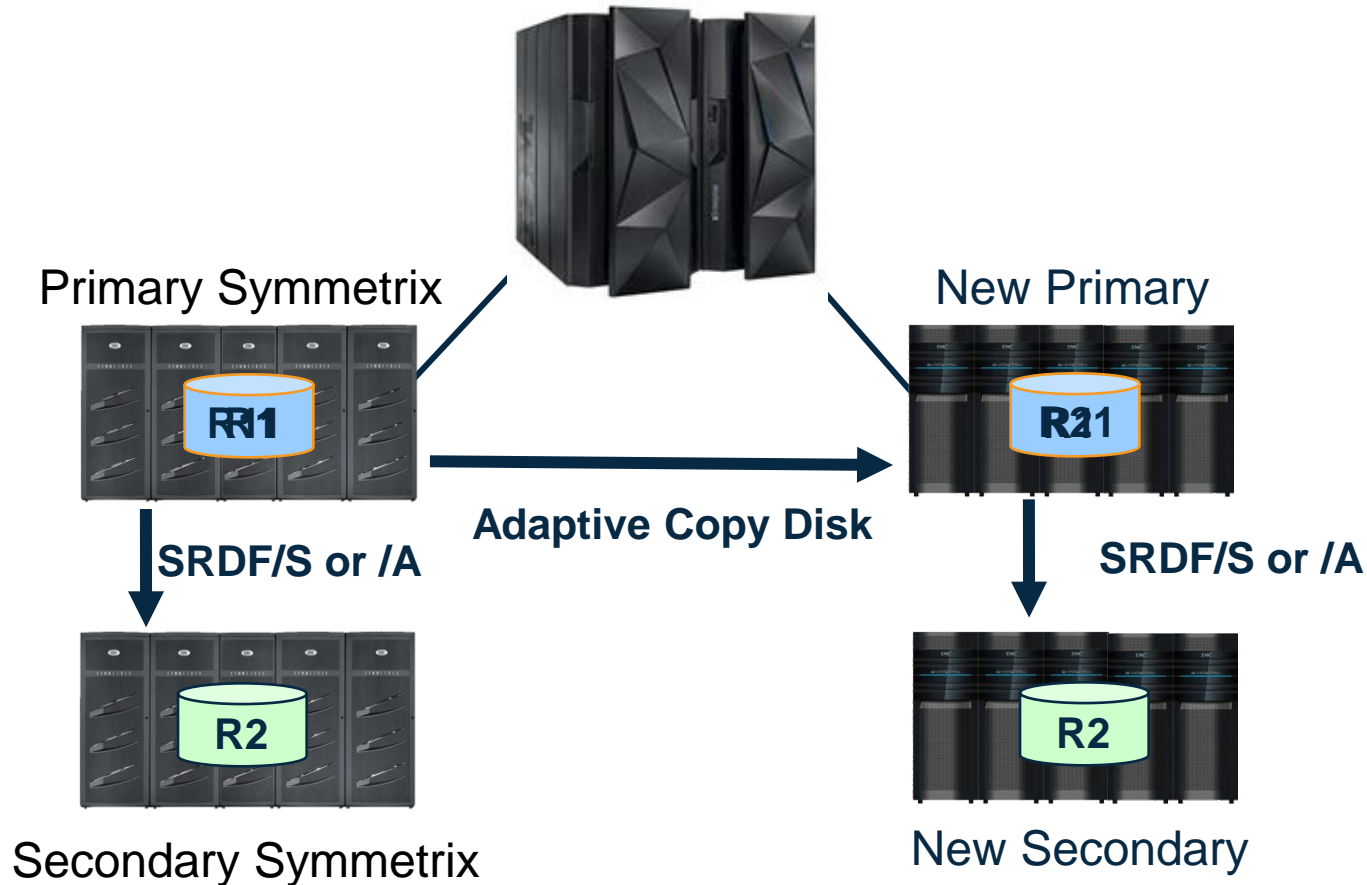- Predictable RPO
- Zero data loss recovery
- Unlimited distance
- **Low bandwidth requirement**
- **Also available in two site configuration**

Complete your session evaluations online at www.SHARE.org/Pittsburgh-Eval

Concurrent SRDF/S:
Persistent AutoSwap Protection

Primary Site

Site A

Regional Site

Site B

R11

Consistency Group

Fault event

R2

SRDF/S

SRDF/S

Consistency Group w/AutoSwap

R2

AutoSwap protection is preserved if secondary SRDF/S link fails

Four Site SRDF for Migration

Primary Symmetrix

New Primary

R1

R21

Adaptive Copy Disk

SRDF/S or /A

SRDF/S or /A

R2

R2

Secondary Symmetrix

New Secondary

Complete your session evaluations online at www.SHARE.org/Pittsburgh-Eval
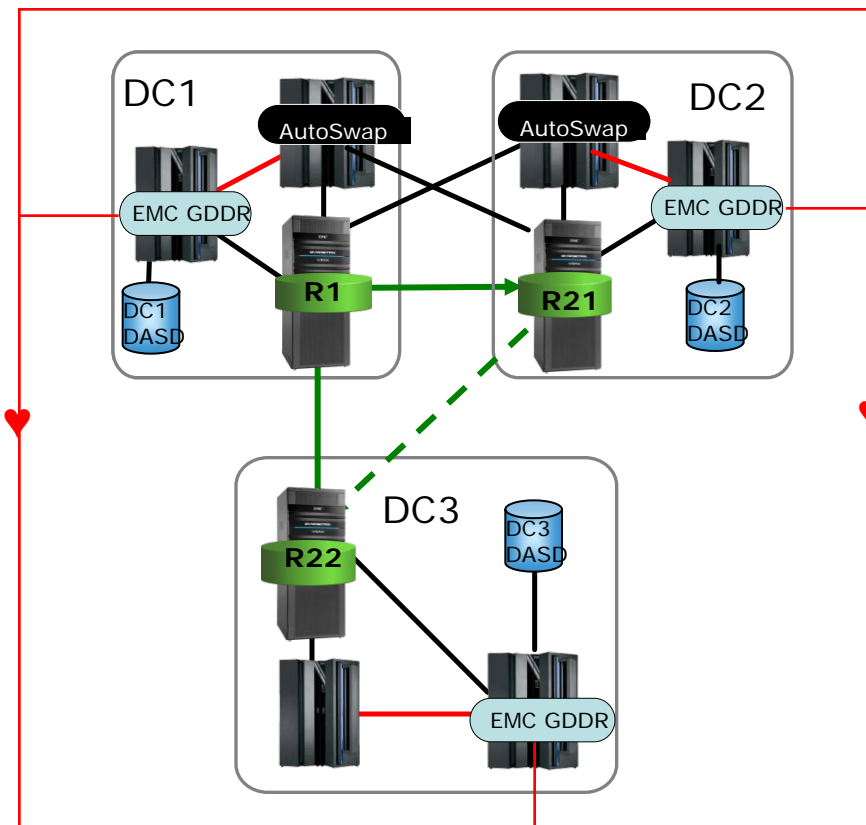
GDDR:
Geographically Dispersed Disaster Restart

- **Comprehensive Business Continuity Automation product**
  - Product-based Offering
  - Available since February 2007
  - Introduces 'automation LPARs' to separate command and control. Known as 'C' systems
  - Expert System based
  - Automation scripts dynamically generated
  - No custom scripting
  - 13 configurations supported: 2, 3, 4 site

- **Sysplex agnostic**
  - Spans sysplexes, creating cross sysplex consistency
  - Full support for non-sysplex systems
  - No reliance on sysplex communications
  - C - systems unaffected by sysplex failures

- **Supports z/OS and distributed systems delivering enterprise consistency and continuous availability**

Four Data Center Strategies
GDDR for SRDF/SQAR
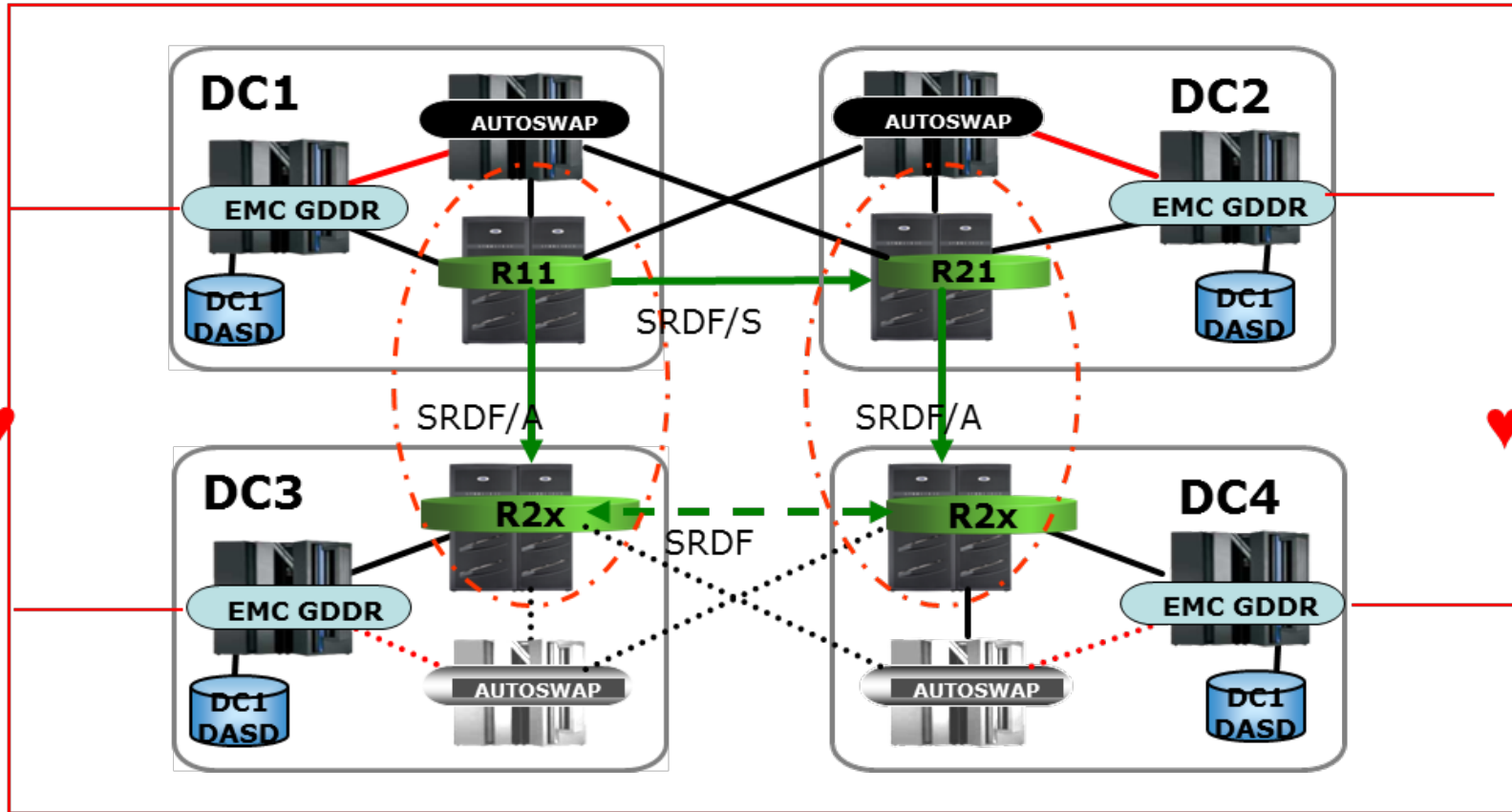
EMC Copy Services Compatibility

- EMC is the first and only vendor with a GDPS lab and VMAX supports:
  - GDPS/PPRC
  - GDPS/XRC
  - GDPS/MzGM
  - GDPS/HM
- Basic Hyperswap with TPC-R (including 2 site FREEZE)
- Flashcopy V2 volume and dataset level
  - Including Remote Pair Flashcopy
- Recent Enhancements:
  - GDPS/PPRC Enhanced Conditional Freeze & Stop support