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GDPS® Overview

The IBM e-Business Availability Solution

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Agenda

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- **Business Continuity Overview**
- **GDPS/PPRC**
- **GDPS/PPRC HM**
- **GDPS/XRC**
- **GDPS/PPRC and GDPS/XRC Common Functions**
- **GDPS/ Global Mirror (preview)**
- **RCMF**
- **Planned Enhancements**
- **Positioning GDPS Solutions**
- **Summary**



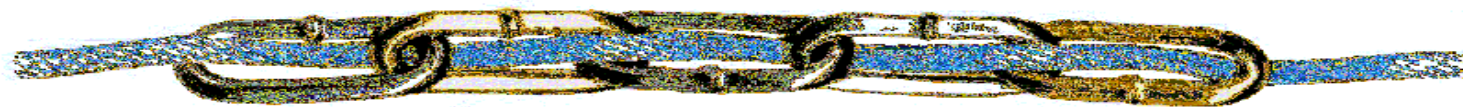
Business Continuity

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Business Continuity is not simply IT Disaster Recovery... it is a management process that relies on each component in the business chain to sustain operations at all times.

- Effective Business Continuity depends on ability to:
 - Reduce the risk of a business interruption
 - Stay in business when an interruption occurs
 - Respond to customers
 - Maintain public confidence
 - Comply with requirements:
 - Audit
 - Regulator/Legislative
 - Insurance
 - Health and Safety



People Facilities Business Processes Infrastructure Applications

... An end-to-end Business Continuity program is only as strong as its weakest link

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Business Continuity Objectives

■ Determine your Objectives for Business Continuity

(by application)

– Recovery Time Objective (RTO)

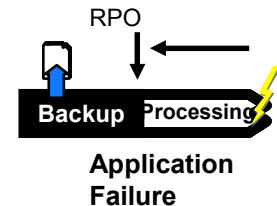
- how long can you afford to be without your systems?

– Recovery Point Objective (RPO)

- when it is recovered, how much data can you afford to recreate?

– Network Recovery Objective (NRO)

- how long to switch over network?



■ Determine cost / recovery time curve

- If I spend a little more, how much *faster* is Disaster Recovery?
- If I spend a little less, how much *slower* is Disaster Recovery?

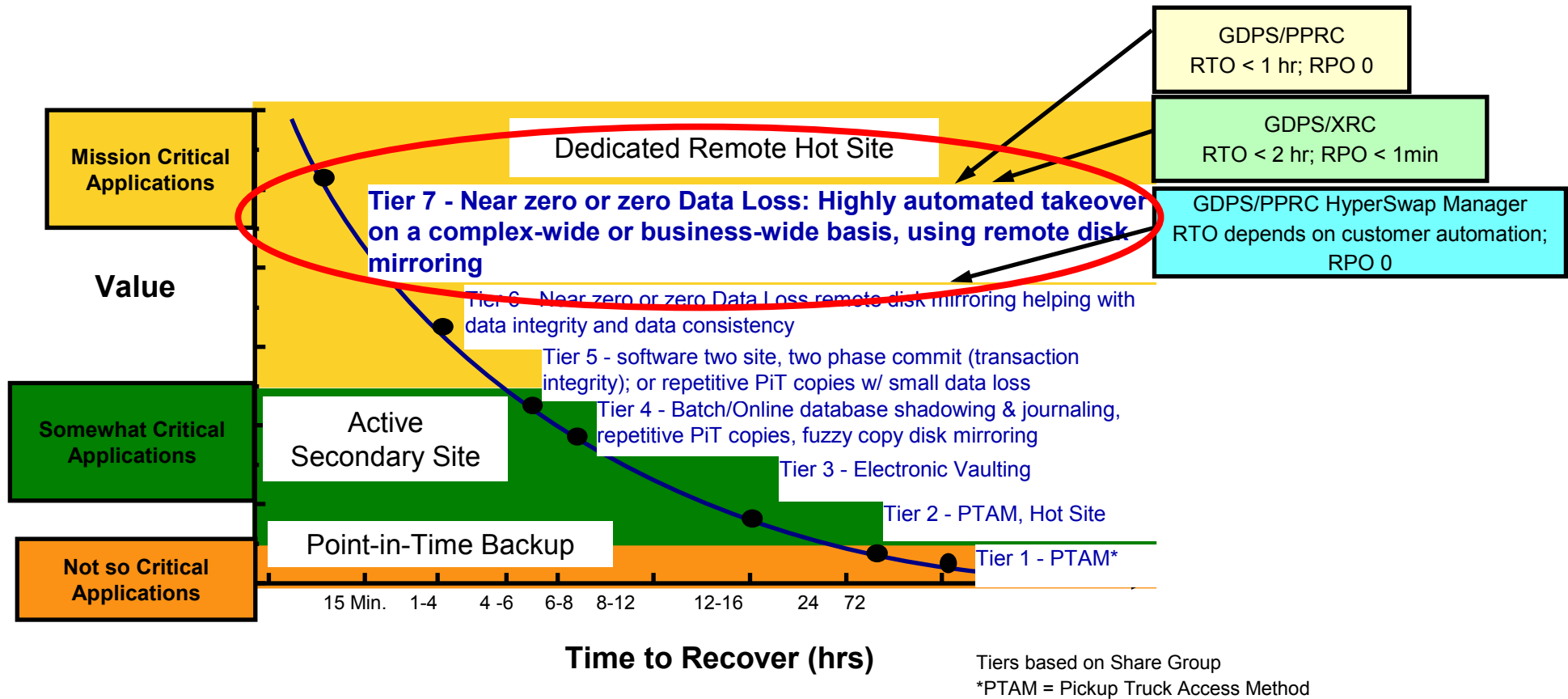
Determining the cost vs. RTO recovery curve is the key to selecting proper solution(s)



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Tiers of Disaster Recovery : Level Setting GDPS



Best D/R practice is blend tiers of solutions in order to maximize application coverage at lowest possible cost . One size, one technology, or one methodology does not fit all applications



Lessons Learned About IT Survival

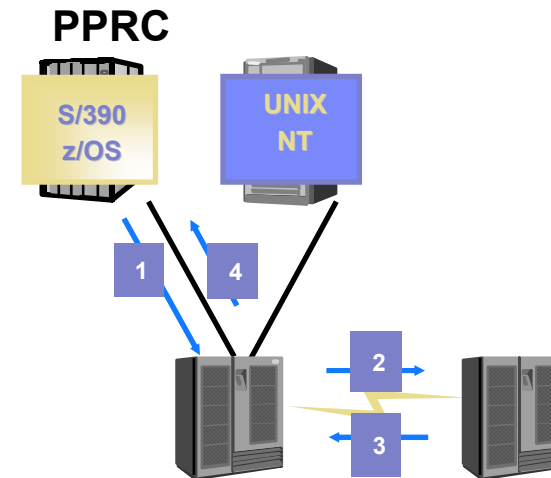
- Repeated Testing before a disaster is crucial to successful recovery after a disaster
- After a disaster, everything is different
 - Staff well-being will be 1st priority
 - Company will benefit greatly from well-documented, tested, available and **automated** (to the extent possible) recovery procedures
- May be necessary to implement in-house D/R solution to meet RTO/RPO
- Plan geographically dispersed IT facilities
 - IT equipment, control center, offices, workstations, phones, staff, . . .
 - Network entry points
- Installed server capacity at second data center can be utilized to meet normal day-to-day needs
- Failover capacity can be obtained by
 - Prioritizing workloads
 - Exploit new technology: Capacity Back Up (CBU)
- Data backup planning and execution must be flawless
 - Disk mirroring required for <12hr RTO (need 2x capacity)
 - Machine-readable data can be backed up; not so for paper files
- Check D/R readiness of critical suppliers, vendors



PPRC and XRC Overview

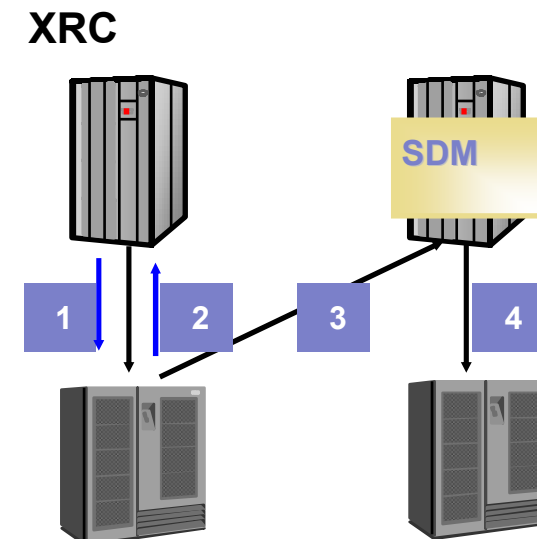
PPRC (Metro Mirror)

- Synchronous remote data mirroring
 - Application receives “I/O complete” when both primary and secondary disks are updated
- Typically supports metropolitan distance
- Performance impact must be considered
 - Latency of 10 us/km



XRC (z/OS Global Mirror)

- Asynchronous remote data mirroring
 - Application receives “I/O complete” as soon as primary disk is updated
- Unlimited distance support
- Performance impact negligible
- System Data Mover (SDM) provides
 - Data consistency of secondary data
 - Central point of control





Business Impact Analysis – Synchronous vs. Asynchronous

Business Impact Analysis

- **Maximum acceptable *response time impact***
- **Maximum acceptable *transaction loss by business process (RPO)***
- **Distance between production and recovery sites**

- **SYNCHRONOUS** remote copy:
 - Use when ***response time impact*** is acceptable
 - Use when distance is short
 - Use when no data loss is ***the objective***
 - ***Often best choice for fastest recovery***
 - **Tradeoff:**
 - ***Meet goal of No data loss & potential CA***
 - vs**
 - ***Application impact & short distance***

- **ASYNCHRONOUS** remote copy:
 - Use when ***smallest possible impact*** to primary site performance is ***required***
 - Use when unlimited distance is ***the objective***
 - ***Use when minimal loss of data is acceptable***
 - **Tradeoff:**
 - ***Negligible appl. impact & unlimited distance***
 - vs**
 - ***Minimal data loss***



Need for Time Consistency

Recovery

Process measured in hours or days

Restore last set of Image Copy tapes
Apply log changes to bring database up to
point of failure

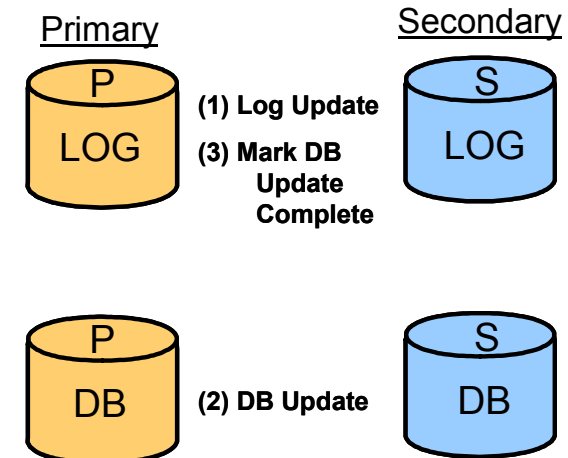
Restart

Process measured in minutes

To start a DB application following an
outage without having to restore the
database

Database restart required for today's high availability requirements
(Can your business tolerate a lengthy database recovery ?)

- Dependent Writes
 - The start of one write is time dependent on the completion of a previous write
- Many examples of Dependent Writes
 - Database & associated log files
 - Catalogs, Volume Table of Content
 - Index & data components
- Time sequence could be exposed during **Rolling Disaster**
- GDPS Freeze function helps assure time consistency of data
- XRC manages secondary consistency
 - Across any number of primary subsystems
 - All writes time-stamped and sorted before committed to secondary devices





What is GDPS?

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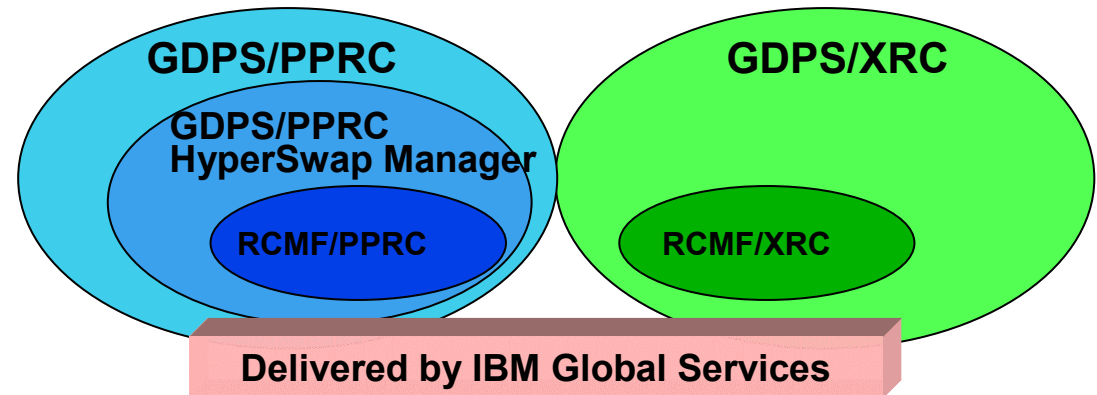


■ Automation that manages application and data availability in and across sites

- Monitors systems, disk & tape subsystems
- Builds on (multi-site) Sysplex and data mirroring technologies
- Manages planned and unplanned exception conditions
 - System maintenance / failure
 - Site maintenance / failure

■ User interface through

- Panels - status and planned actions
- Scripts - planned and unplanned actions



*Designed for Continuous Application & Data Availability
Single point of control
Delivered through IBM Services*



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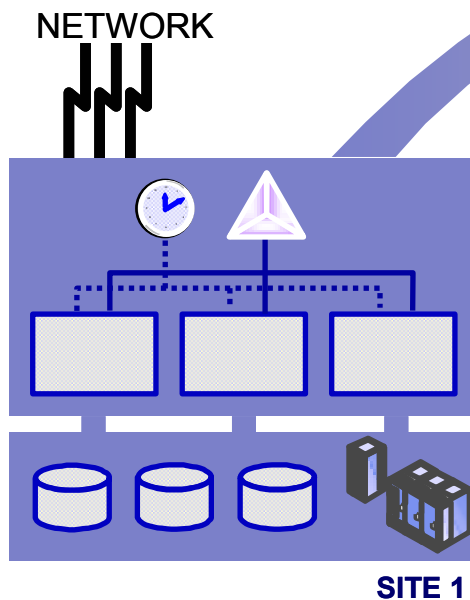


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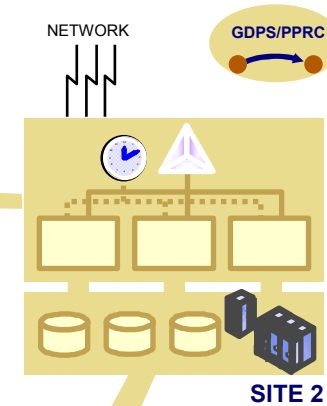


What is GDPS/PPRC? (Metro Mirror)

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**Planned and Unplanned
exception conditions**



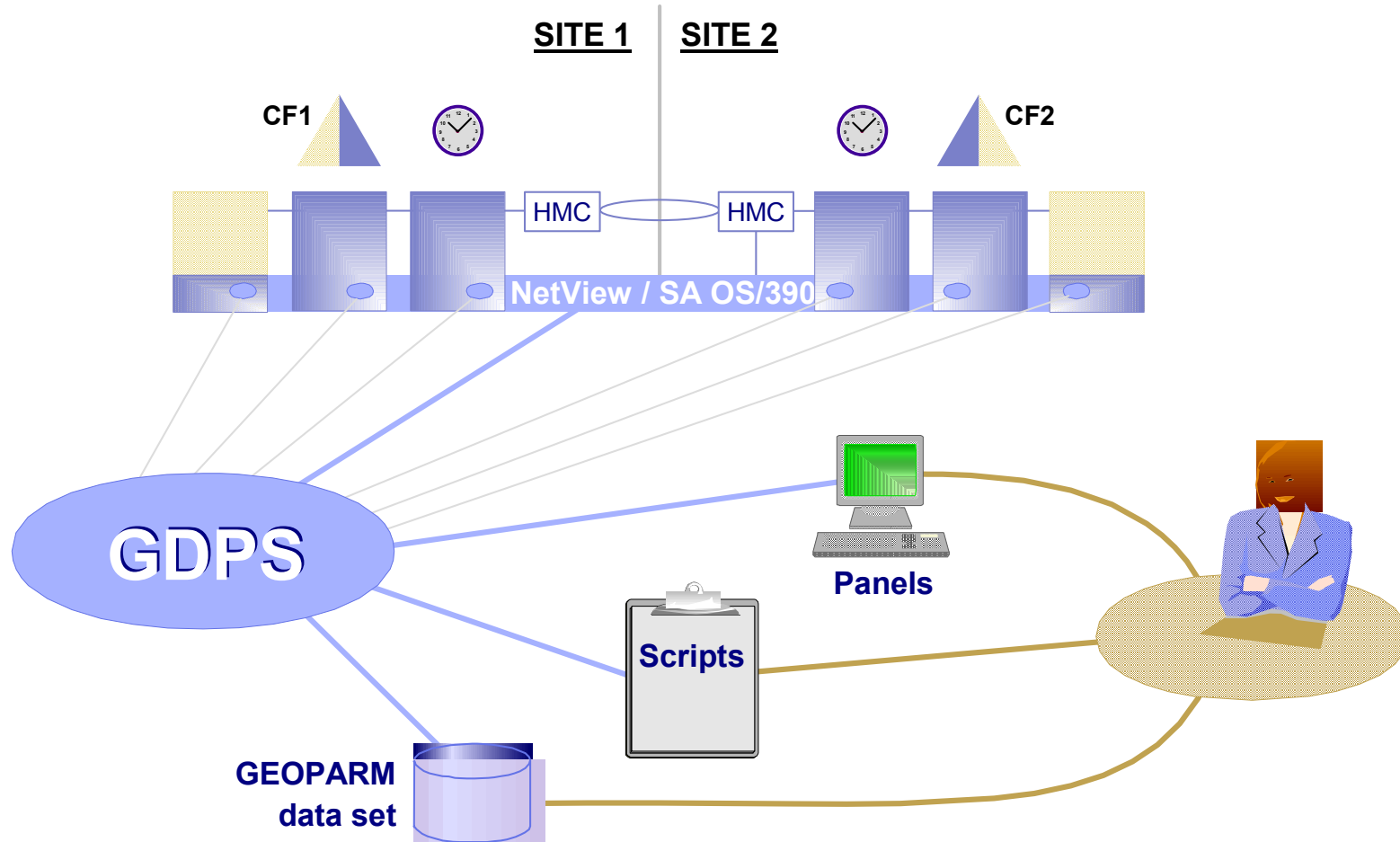
- **Multi-site base or Parallel Sysplex environment**
 - Sites separated by up to 100 km of fiber
- **Remote data mirroring using PPRC**
- **Manages unplanned reconfigurations**
 - z/OS, CF, disk, tape, site
 - Designed to maintain data consistency and integrity across all volumes
 - Supports fast, automated site failover
 - No or limited data loss - (customer business policies)
- **Single point of control for**
 - Standard actions
 - Stop, Remove, IPL system(s)
 - Parallel Sysplex Configuration management
 - Couple data set (CDS), Coupling Facility (CF) Management
 - User defined script (e.g. Planned Site Switch)
 - PPRC Configuration management



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GDPS/PPRC Building Blocks





Freeze Policy Options

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FREEZE & GO

- ◆ Freeze secondary DASD configuration
- ◆ Allow applications to continue
- Optimize for remote restartability
- Least impact on application availability
- May lose data in case of real disaster

FREEZE & STOP

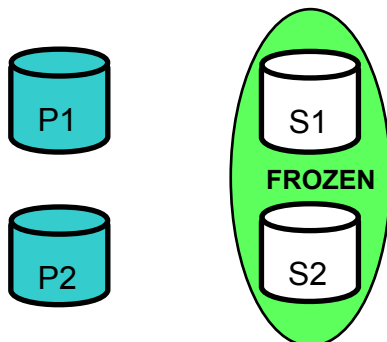
- ◆ Freeze secondary DASD configuration
- ◆ Stop all OS/390 and z/OS images
- Optimize for remote restartability
- Impacts application availability
- No data loss on primary site disaster

FREEZE & STOP Conditional

- ◆ Freeze secondary DASD configuration
- ◆ Determine reason for Suspend
 - ◆ If secondary HW problem then **FREEZE & GO**
 - ◆ Other reason: **FREEZE & STOP**

SWAP, [Go|STOP]

- ◆ If Swap trigger and HyperSwap enabled
 - ◆ Swap primary / secondary disks
 - Executed before error condition transpires to appl
 - ◆ If swap cannot complete, **STOP**
- ◆ Else (Freeze trigger)
 - ◆ If SWAP, **GO**
 - **FREEZE & GO**
 - ◆ If SWAP, **STOP**
 - **FREEZE & STOP**



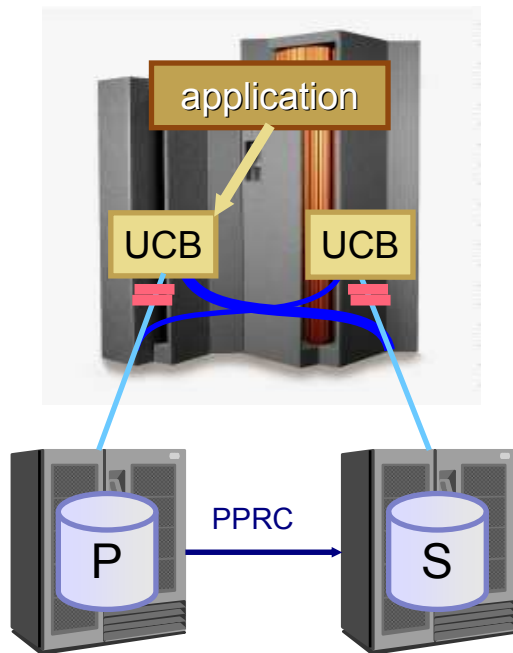
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GDPS/PPRC HyperSwap – the Technology



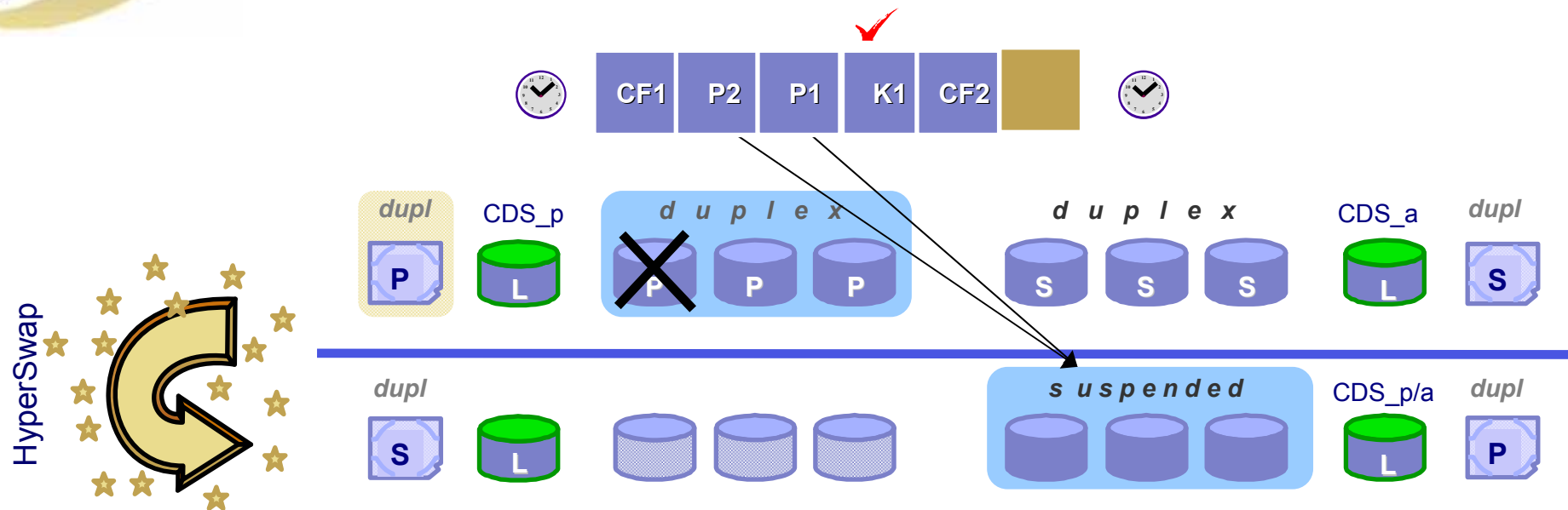
- Extends Parallel Sysplex availability to disk subsystems
- Masks *primary disk subsystem failures* by transparently switching to use secondary disks
- Provides ability to perform disk maintenance and planned site maintenance without requiring applications to be quiesced
- Swaps large number of disks very fast
- Managed by GDPS automation
- Disk no longer a single point of failure
- Available with GDPS/PPRC and GDPS/PPRC HyperSwap Manager offerings

GDPS brings different technologies together to provide a comprehensive application and data availability solution



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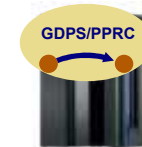
Unplanned Disk Reconfiguration with HyperSwap



- Parallel Sysplex – P1, P2, K1 (GDPS controlling system)
- ✓ **Disk Failure detected**
- **GDPS automation invokes**
 - HyperSwap disk configuration
 - Swap primary / secondary disks
 - **Failover invoked (secondary disks in suspended state)**
 - After primary disk failure fixed
 - **Failback invoked (updates to data copied)**
 - Execute HyperSwap again to return to original configuration

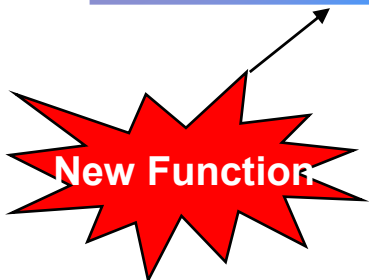
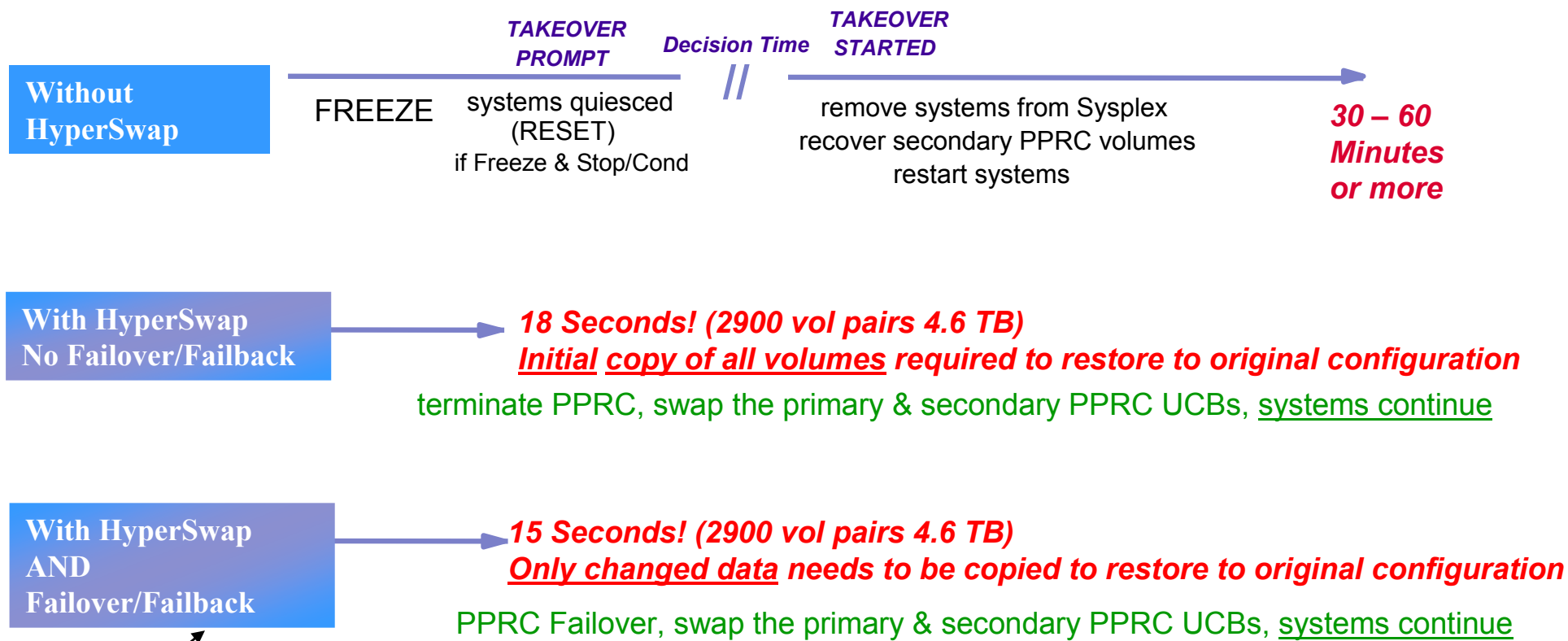
PPRC failover/failback exploitation eliminates need for full copy when going back

P1, P2, remain active throughout the procedure



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Benchmark Measurements – Unplanned Disk Reconfiguration



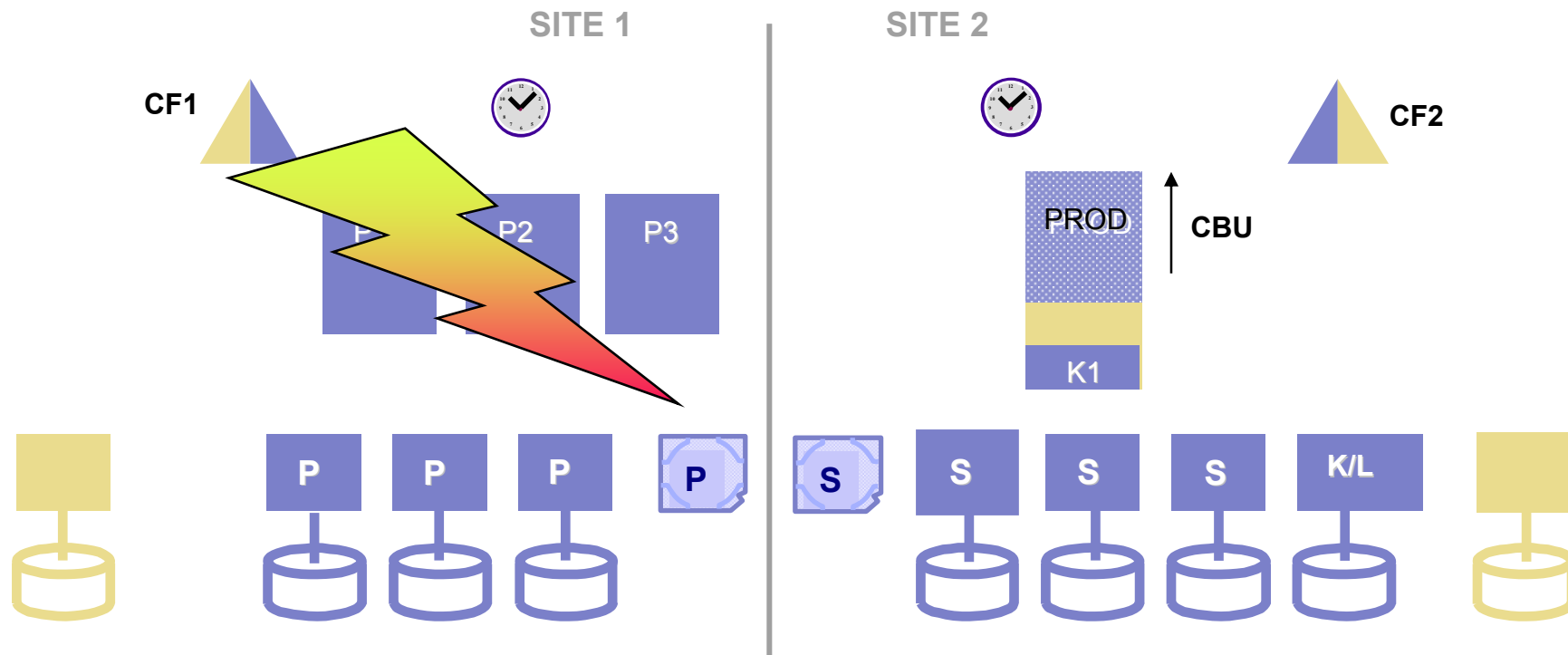
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Single Site Workload - Cross-site Sysplex Near Continuous Availability Configuration



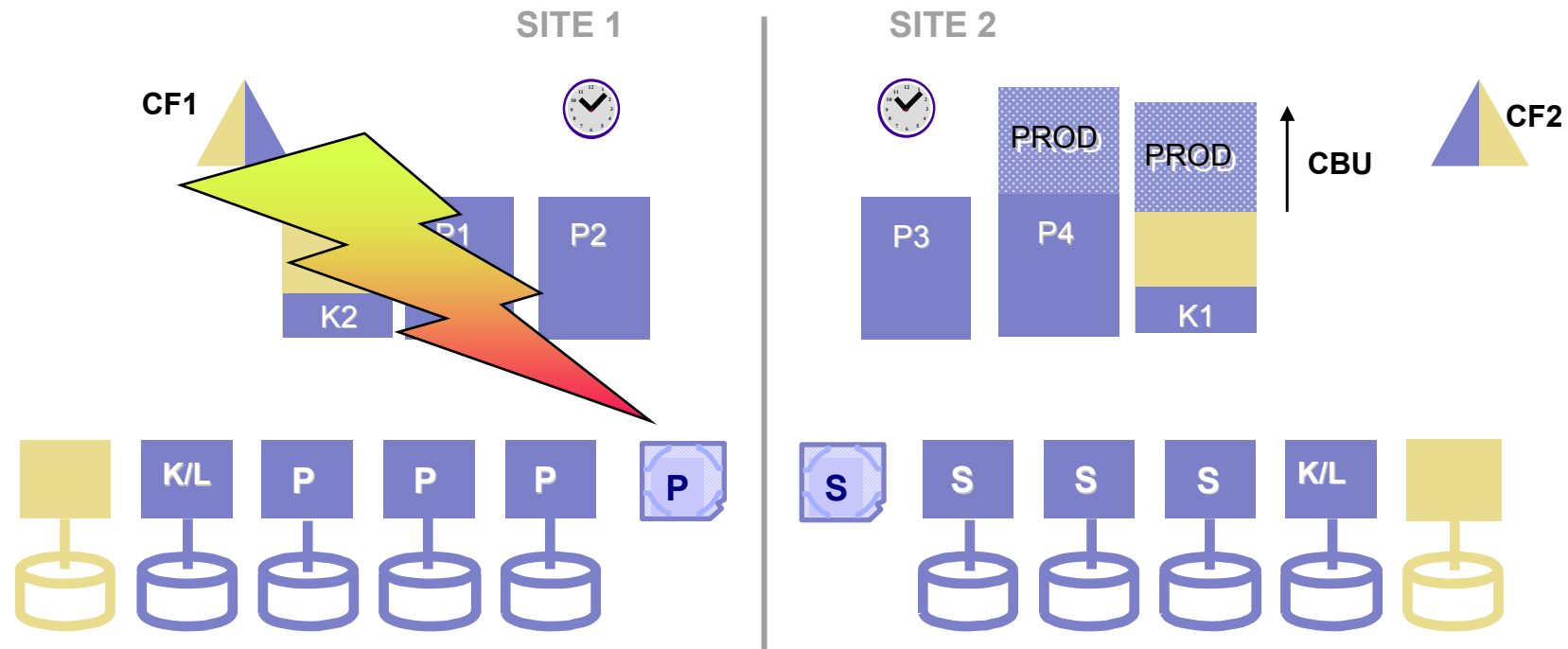
- GDPS detected/initiated failure processing
- Designed to provide continuous access to data via HyperSwap
- Highly automated site failover for catastrophic Site1 failure
- Planned reconfigurations



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Multiple Site Workload - Cross-site Sysplex Continuous Availability Configuration



- GDPS detected/initiated failure processing
- Provides protection against single points of failure systems protected by Parallel Sysplex, disks protected by HyperSwap
- Designed to provide near continuous application availability in the event of a catastrophic failure involving multiple components
- Planned system/disk/sysplex resource/site reconfiguration



Unplanned Cross-site Reconfiguration

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ANALYSIS

Present actual status to operator
Request takeover authorization



SITUATION MANAGEMENT

- Remove systems from Sysplex
- Perform disk reconfiguration
- Perform tape reconfiguration
- Perform CBU activation
- Perform CF reconfiguration
- Perform CDS reconfiguration
- Acquire processing resources and IPL systems into Sysplex
- Initiate application startup

FREEZE

Tape and disk subsystems
I/O consistent secondaries

- Across multiple CUs
- Multiple host systems

Customer business policies

- Freeze & Go, Freeze & Stop, Freeze & Stop Conditional
- Swap [GO|STOP]

AUTOMATION

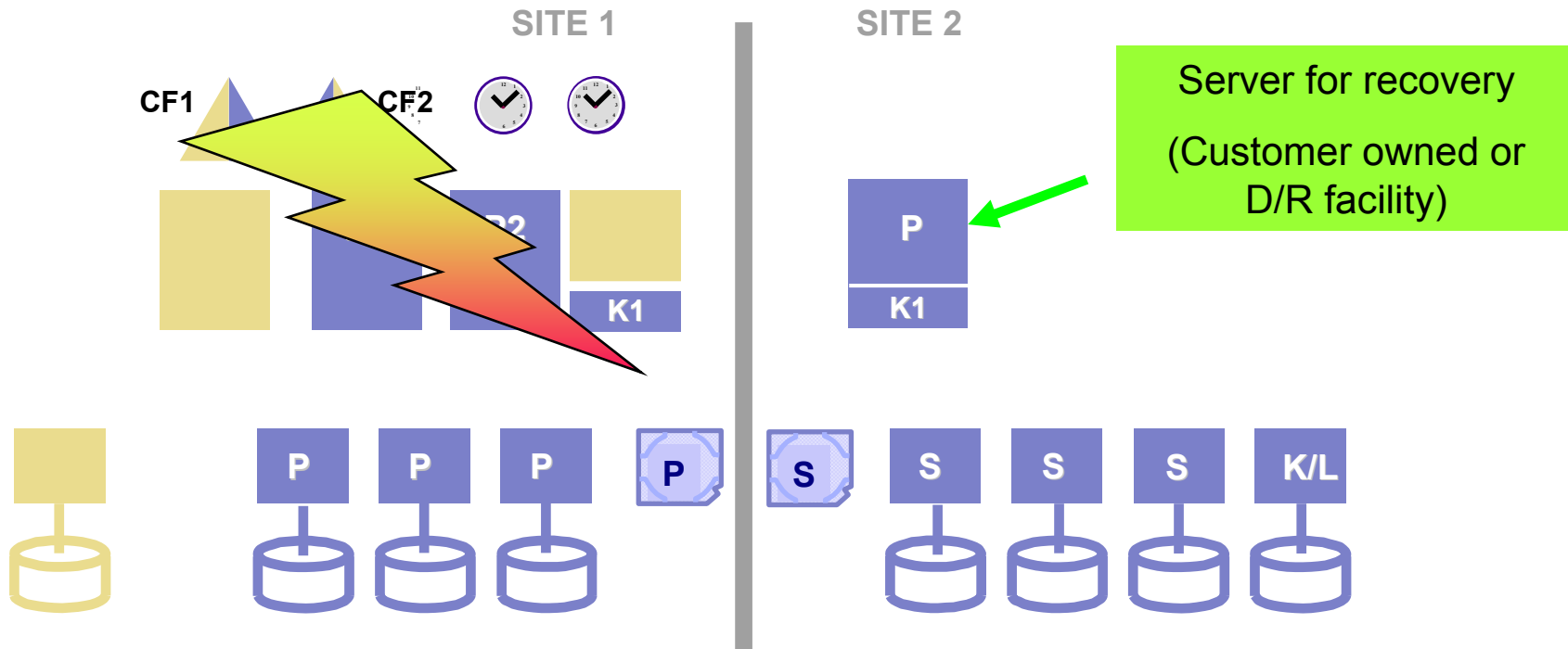
Error Event

- Sysplex
- Disk subsystem
- Tape subsystem



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Sysplex in a single site
(aka BRS configuration) PPRC across sites



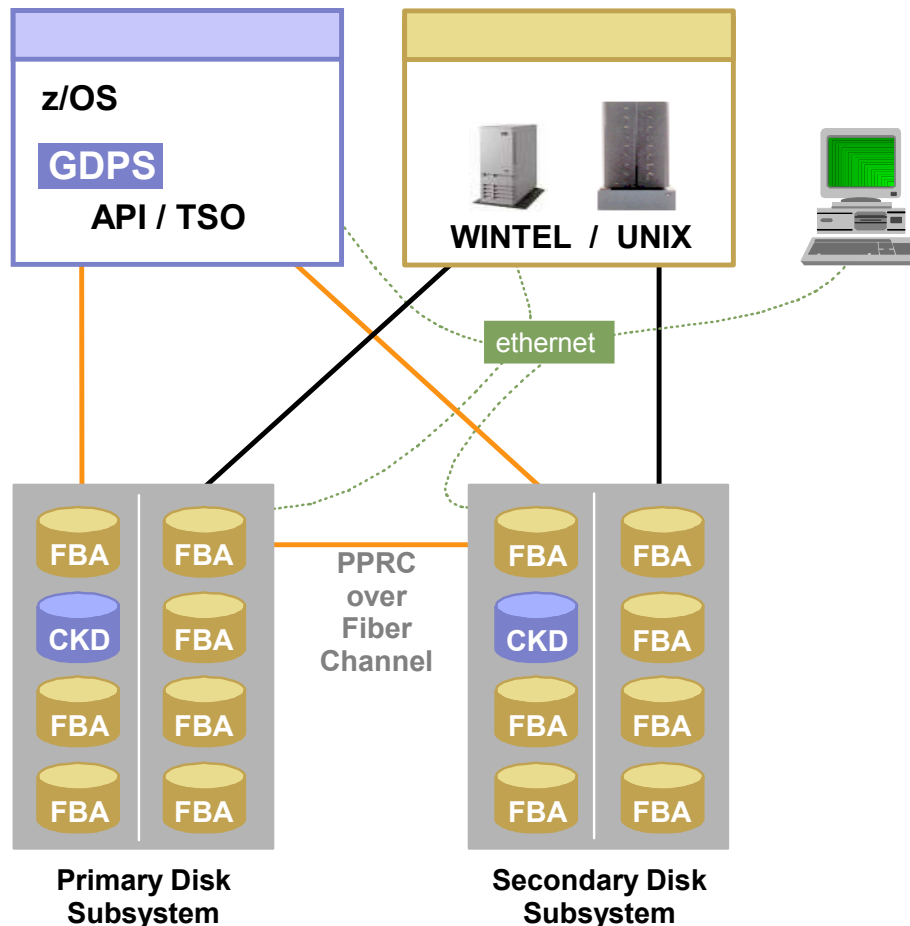
Up to 100 km

IPL K system in Site 2
GDPS automation restarts Production systems and applications
No Data Loss. Full data consistency



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GDPS/PPRC management of Open Systems LUNs



- Extends GDPS/PPRC technology to manage distributed applications across multiple platforms
 - z/OS and open systems data (Unix, NT, Linux)
- GDPS/PPRC running in a z/OS system manages the PPRC status of devices that belong to the other platforms
- Provides data consistency across both z/OS and/or open systems data when failures occur
- Requires
 - Some CKD capacity in disk subsystem
 - PPRC support for Open PPRC, management of Open PPRC via CKD device addresses, and Open PPRC SNMP alerts
- Support details
 - Supports x-platform or platform level Freeze
 - FlashCopy not supported for Open
 - No GDPS Code running on Open Systems host - suspend reported through SNMP alert
 - Manual restart of Open systems required

Helps provide enterprise-wide Disaster Recovery with data consistency!

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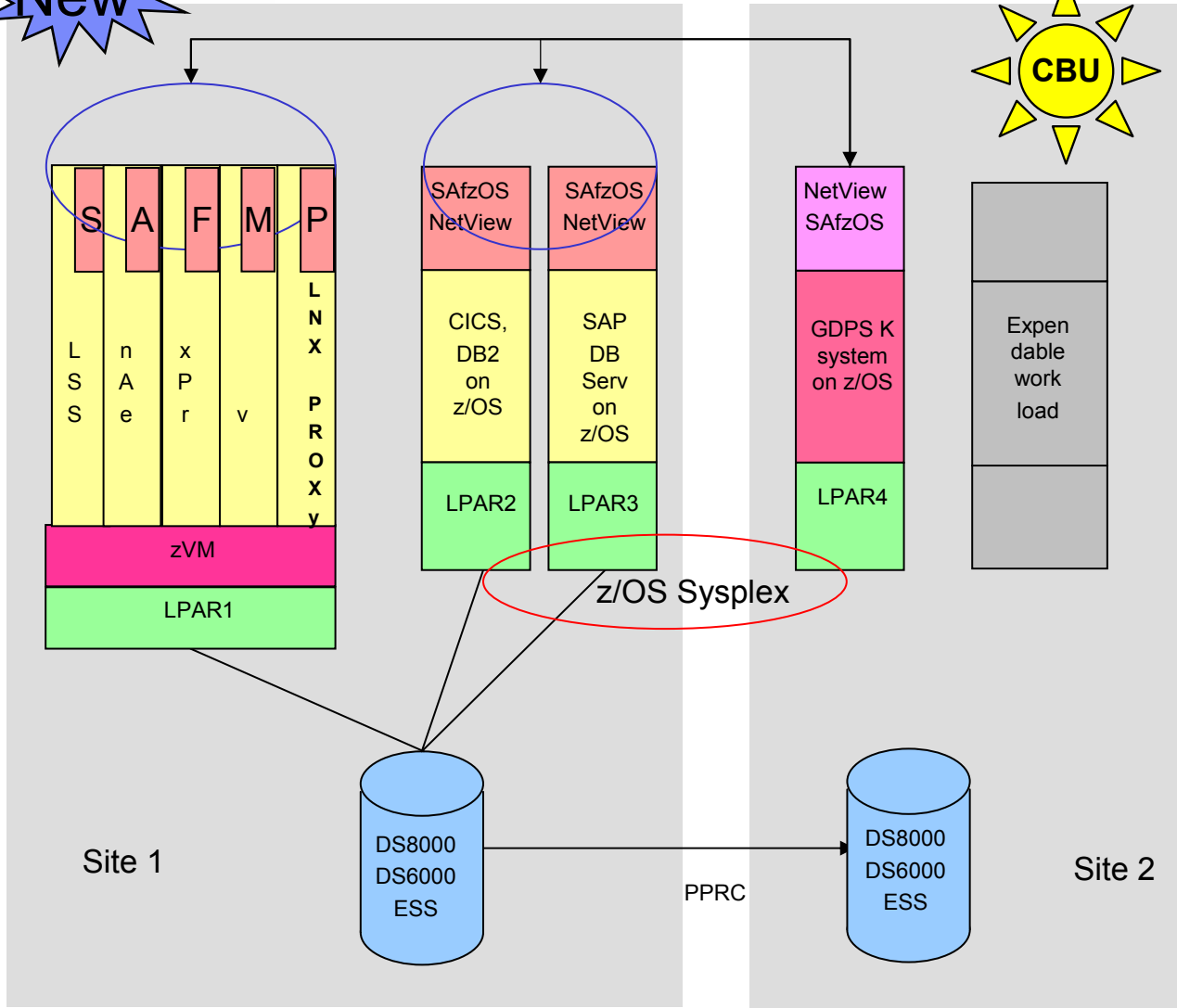
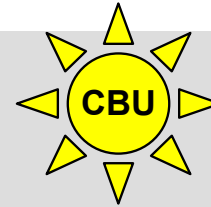


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GDPS/PPRC Multi Platform Resiliency for zSeries



New



- Valuable to customers with distributed applications
 - SAP application server running on Linux on zSeries;
 - SAP DB server running on z/OS
 - etc.
- Coordinated near-continuous availability and DR solution for z/OS and Linux guests running under z/VM
- GDPS exploits z/VM HyperSwap function to switch to secondary disks mirrored by PPRC
- zVM lpars and Linux guests recovery managed by GDPS



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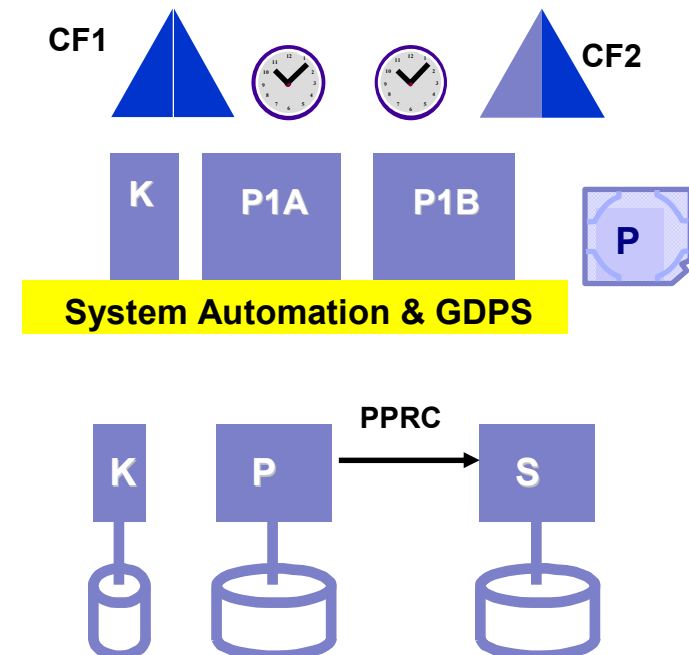
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GDPS/PPRC HyperSwap Manager

**Maximum resilience for z/OS data in a single site
Entry-level disaster recovery across two sites**

- **GDPS automation runs on all systems sharing the PPRCed disks**
- **Manages PPRC**
- **Unplanned, autonomic actions**
 - Monitors disk
 - Manages secondary data consistency in the event of mirroring failures
 - Invokes HyperSwap if primary disk fails
 - Protects data integrity during the swap
 - GDPS will kill systems that fail to swap
- **Planned, user initiated actions**
 - HyperSwap to switch disks





GDPS/PPRC HyperSwap Manager Benefits

- **Availability**
 - Extends Parallel Sysplex Availability to disk subsystems
- **System Management**
 - Simplifies management of Remote Copy configuration, reducing storage management costs
 - Reduces time required for remote copy implementation
 - Combines the features of Remote Copy management with the automation of GDPS
- **Effective entry level offering for customers that require high levels of availability**
 - Specially priced Tivoli NetView and System Automation products
 - Positioned to upgrade to full GDPS

*Parallel Sysplex designed to provide Near-Continuous Availability of systems, servers and applications within a single site
(degree of availability depends on exploitation of Parallel Sysplex)*



GDPS/PPRC HM vs full GDPS/PPRC

Quick high-level comparison

- No Sysplex Resource management
 - No Server Management (except where required by Freeze/HyperSwap)
 - No advanced FlashCopy options (all FlashCopies are NOCOPY)
 - No GDPS automation scripts
 - No Multi Platform Resiliency for zSeries
-
- ✓ Low cost “light” System Automation or System Automation+NetView
 - ✓ Lower license/implementation cost
 - ✓ Faster implementation times

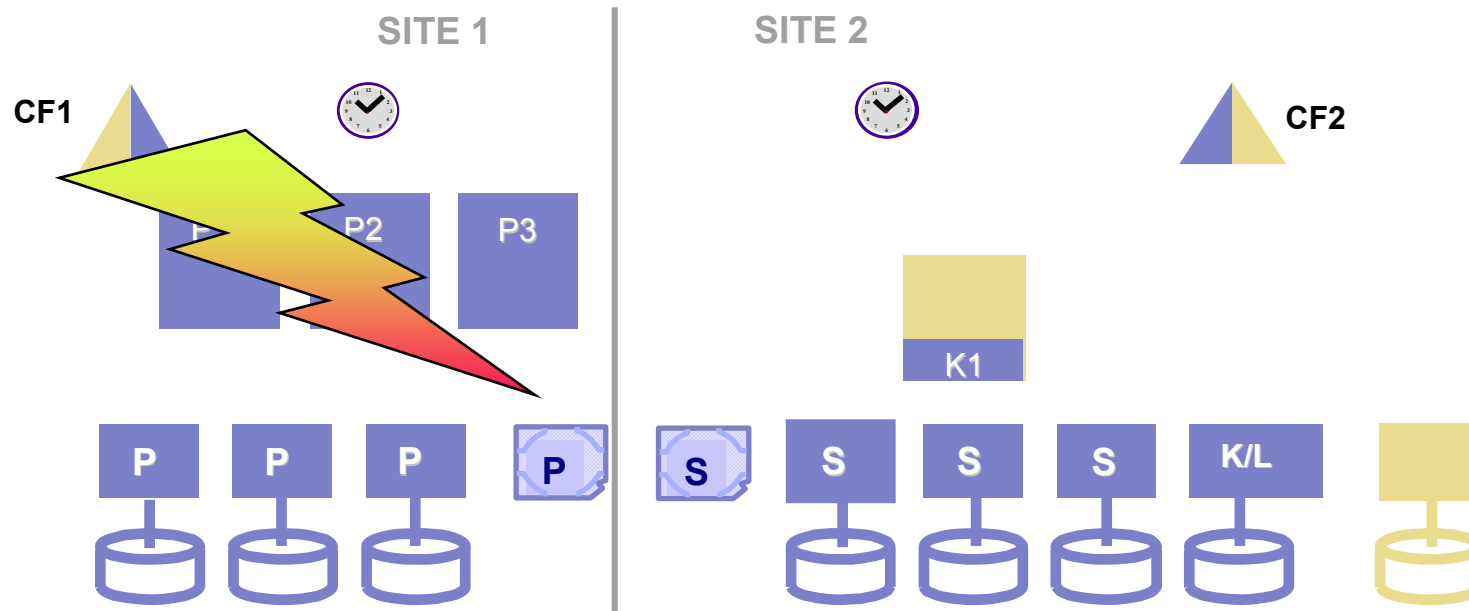


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Single Site Workload - Cross-site Sysplex Near Continuous Availability Configuration

GDPS/PPRC HyperSwap Manager



- ❑ **Designed to support continuous access to data from Site 1**
- ❑ **Unplanned and Planned Disk reconfiguration with HyperSwap**
- ❑ **Site1 Failure**
 - ❑ **HyperSwap disks or Freeze secondary disks (GDPS automation task)**
 - ❑ **Recover secondary disks for a Freeze trigger (from GDPS panels)**
 - ❑ **Invoke CBU; re-IPL systems; restart applications (Customer task)**



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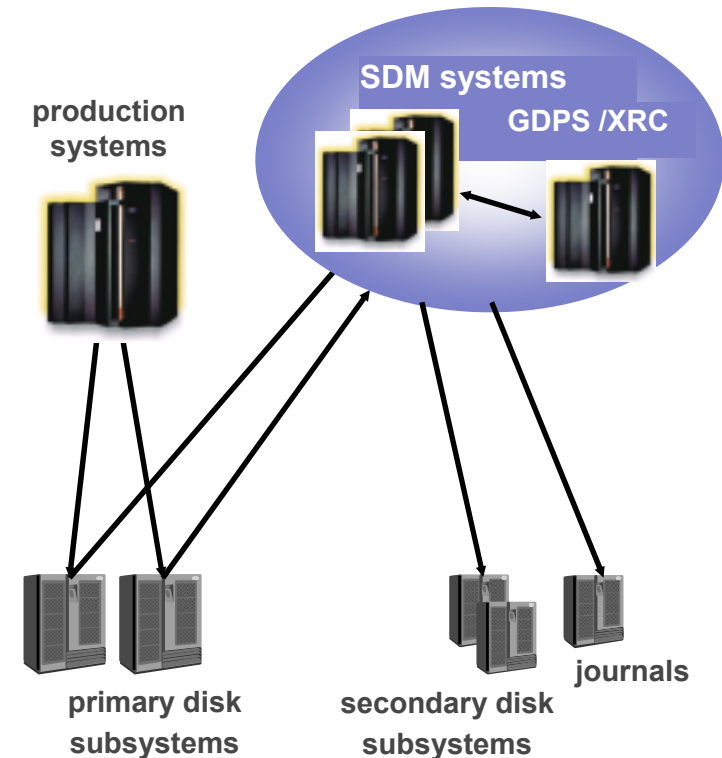


What is GDPS/XRC ? (z/OS Global Mirror)

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- **Productivity tool that integrates management of XRC and FlashCopy**
 - Full-screen interface
 - Invoke scripted procedures from panels or through exit
- **GDPS/XRC runs in the SDM location and interacts with SDM(s)**
 - Manages availability of SDM Sysplex
 - Performs fully automated site failover
- **Single point of control for multiple / coupled Data Movers**

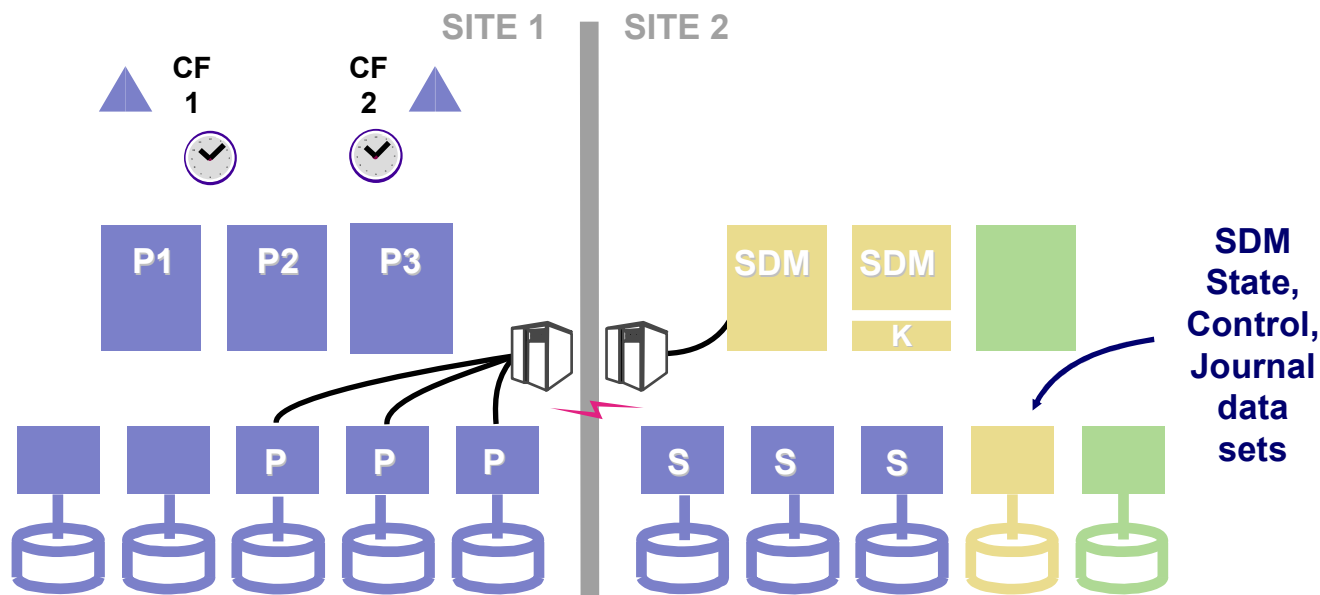




GDPS / XRC

Long distance failover for zSeries only

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GDPS/XRC Manages:
 XRC Failover automation
 FlashCopy, CBU
 Peer-to-Peer VTS

- **Virtually unlimited distance**
- GDPS manages remote copy
 - Extended remote copy (XRC)
 - Asynchronous
 - Minimal (seconds) data loss
- Failover initiated by user
- Once initiated, **failover is totally automated**
 - Recovery of secondary disks
 - Activation of emergency backup capacity
 - Reconfiguration of the recovery site servers
 - Restart of production systems in the recovery site

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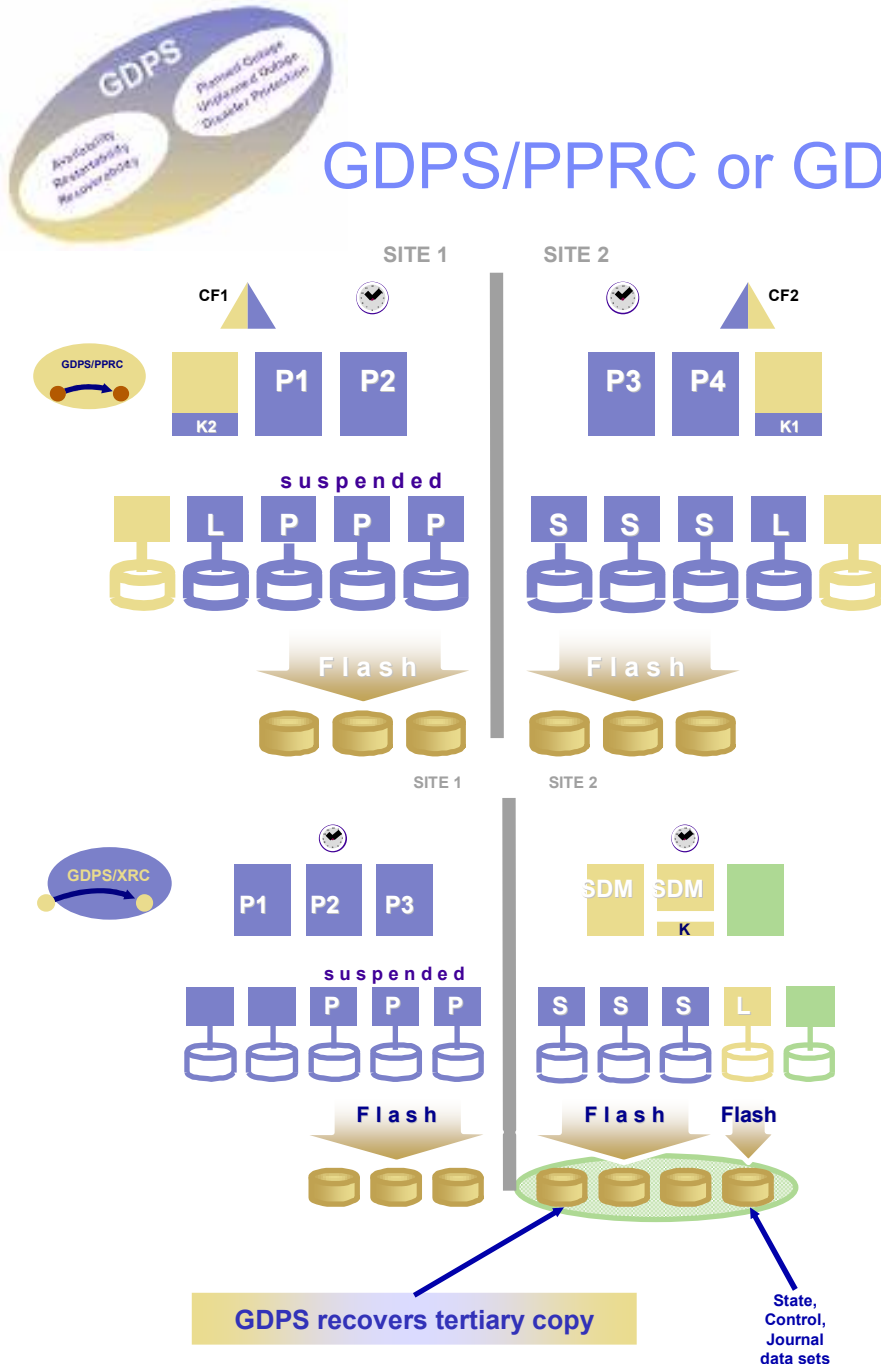


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GDPS/PPRC or GDPS/XRC FlashCopy Support



- **GDPS-initiated FlashCopy**
 - Before resynchronization
 - Maintain D/R readiness while resynchronizing
- **User-initiated FlashCopy**
 - Requested from GDPS panel or through exit
 - Enable parallel processing against tertiary copy: (point in time) backup, ...
- **FlashCopy secondaries and optionally primaries**
 - GDPS can also FlashCopy State, Control and Journal
 - GDPS can recover tertiary copy
- **New support in GDPS V3.2**
 - Nocopy2copy
 - Incremental Flash Copy



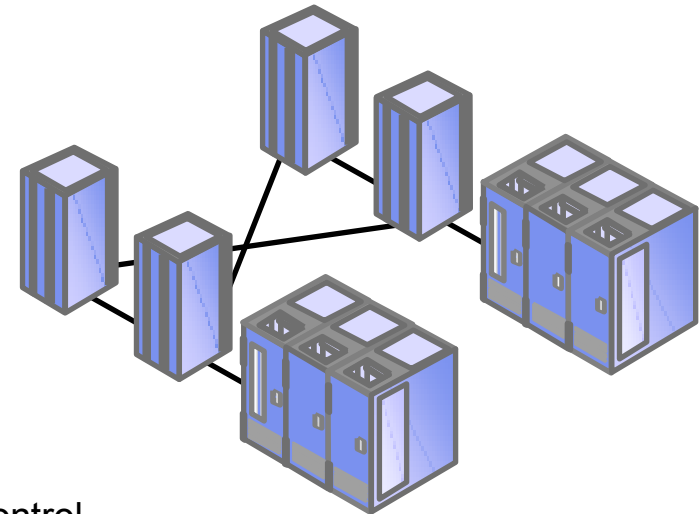


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GDPS/PPRC & GDPS/XRC Supports IBM TotalStorage Peer-to-Peer Virtual Tape Server (PtP VTS)

- Existing workload modes: Balanced, Preferred
- New workload mode to support GDPS: Primary
 - Primary VTS performs all host I/O
 - Secondary receives copies
- GDPS sets copy mode to 'immediate'
- Tape control data sets to be placed on PPRC volumes
- Planned and unplanned site switch
 - Coordinated disk / tape failover in single GDPS script
 - GDPS lists volumes 'in flight' to facilitate manual adjustment of tape control data sets after unplanned failover

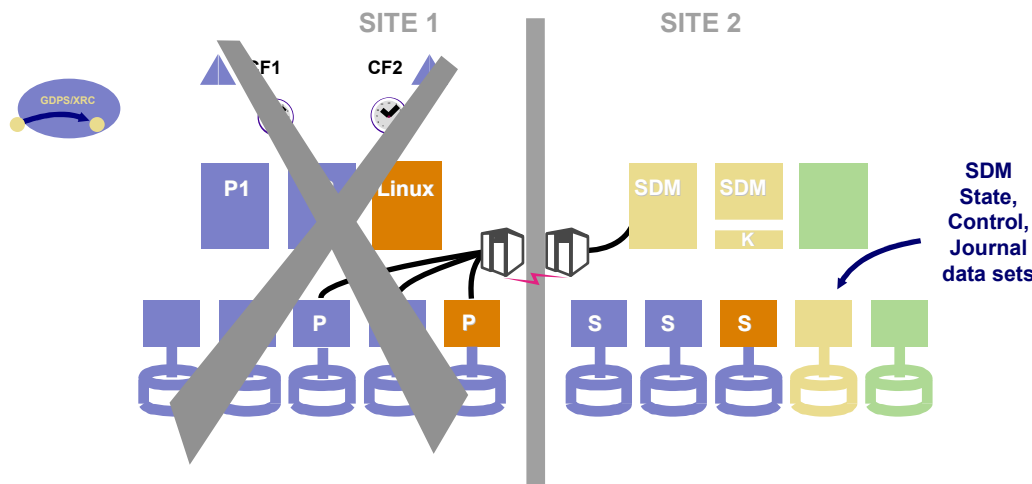
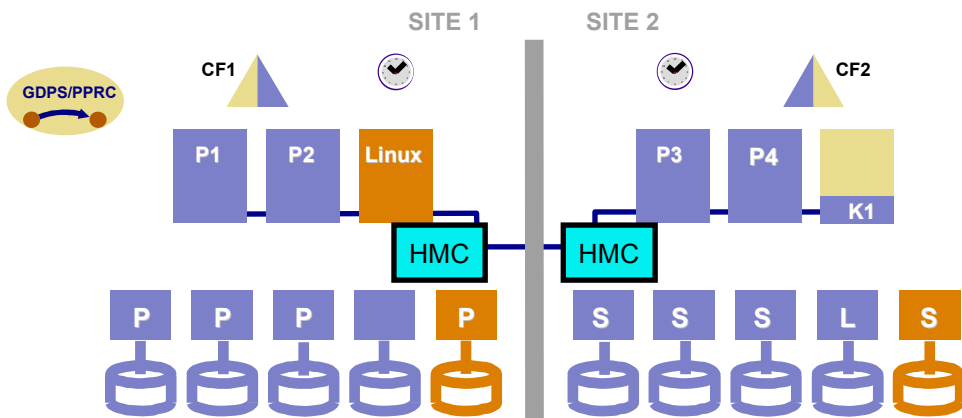


**Secondary data consistent across disk and tape
Integrated disk / tape site failover
Vastly reduced complexity in site failover**

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GDPS/PPRC and GDPS/XRC manage Linux** for zSeries



- Planned and Unplanned reconfigurations
- Unplanned Site Reconfiguration driven by z/OS
 - Controlling System recovers secondary disks including Linux
 - Expendable workload stopped
 - CBU invoked, if applicable
 - Site 1 production systems restarted including Linux
- GDPS manages PPRC Linux volumes

- Unplanned Site Reconfiguration manually initiated by Customer
 - Controlling System recovers secondary disks including Linux
 - Expendable workload (SDM) stopped
 - CBU invoked, if applicable
 - Site 1 production systems restarted including Linux
- GDPS manages XRC Linux volumes
- Linux for zSeries extended to time stamp data

Another step towards Enterprise-wide D/R management

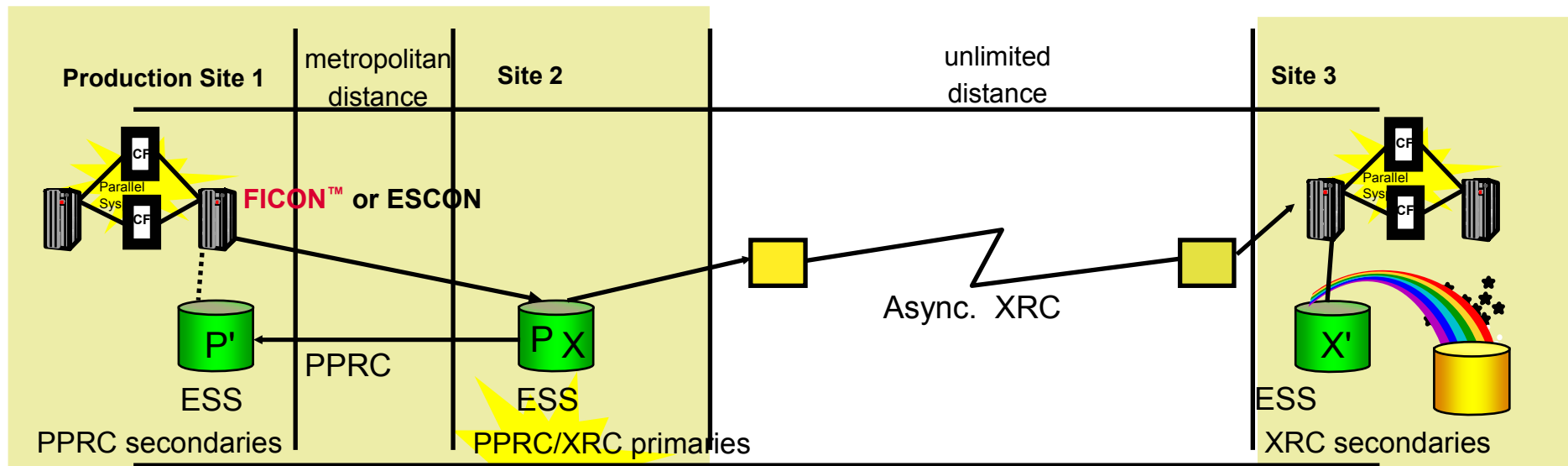
** GDPS manages all zSeries Operating Systems (e.g. z/VM, VSE/ESA)

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zSeries Solution designed to provide CA and DR at unlimited distance



◀ Continuous Availability ▶

- Designed to provide continuous availability and no data loss between sites 1 and 2
- Sites 1 and 2 can be same building or campus distance to minimize performance impact

◀ Disaster/Recovery ▶

- Production site 1 failure
 - ▶ Site 3 can recover with no data loss in most instances
- Site 2 failure
 - ▶ Production can continue with site 1 data (P')
- Site 1 and 2 failure
 - ▶ Site 3 can recover with minimal loss of data



Agenda

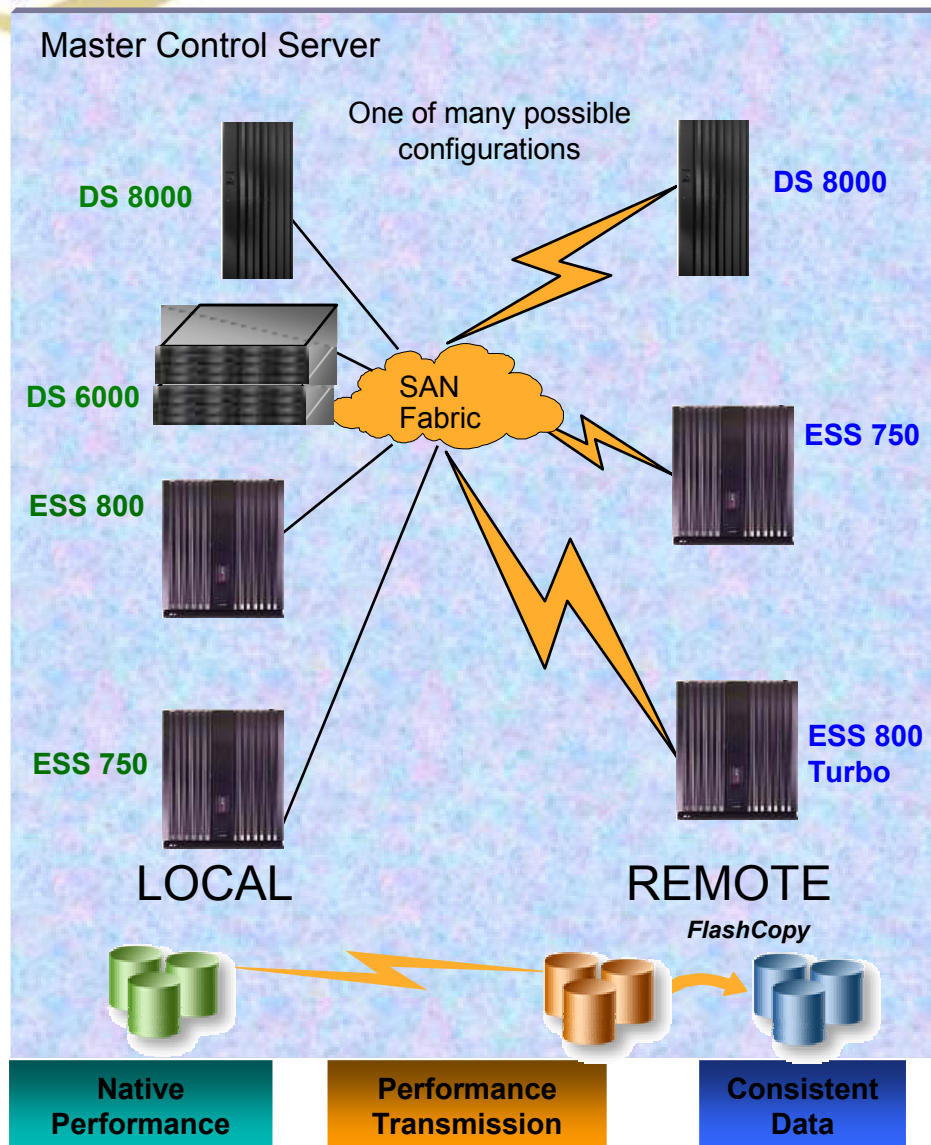
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- **Business Continuity Overview**
- **GDPS/PPRC**
- **GDPS/PPRC HM**
- **GDPS/XRC**
- **GDPS/PPRC and GDPS/XRC Common Functions**
- **GDPS/ Global Mirror (preview)**
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IBM TotalStorage Global Mirror



Designed to Provide:

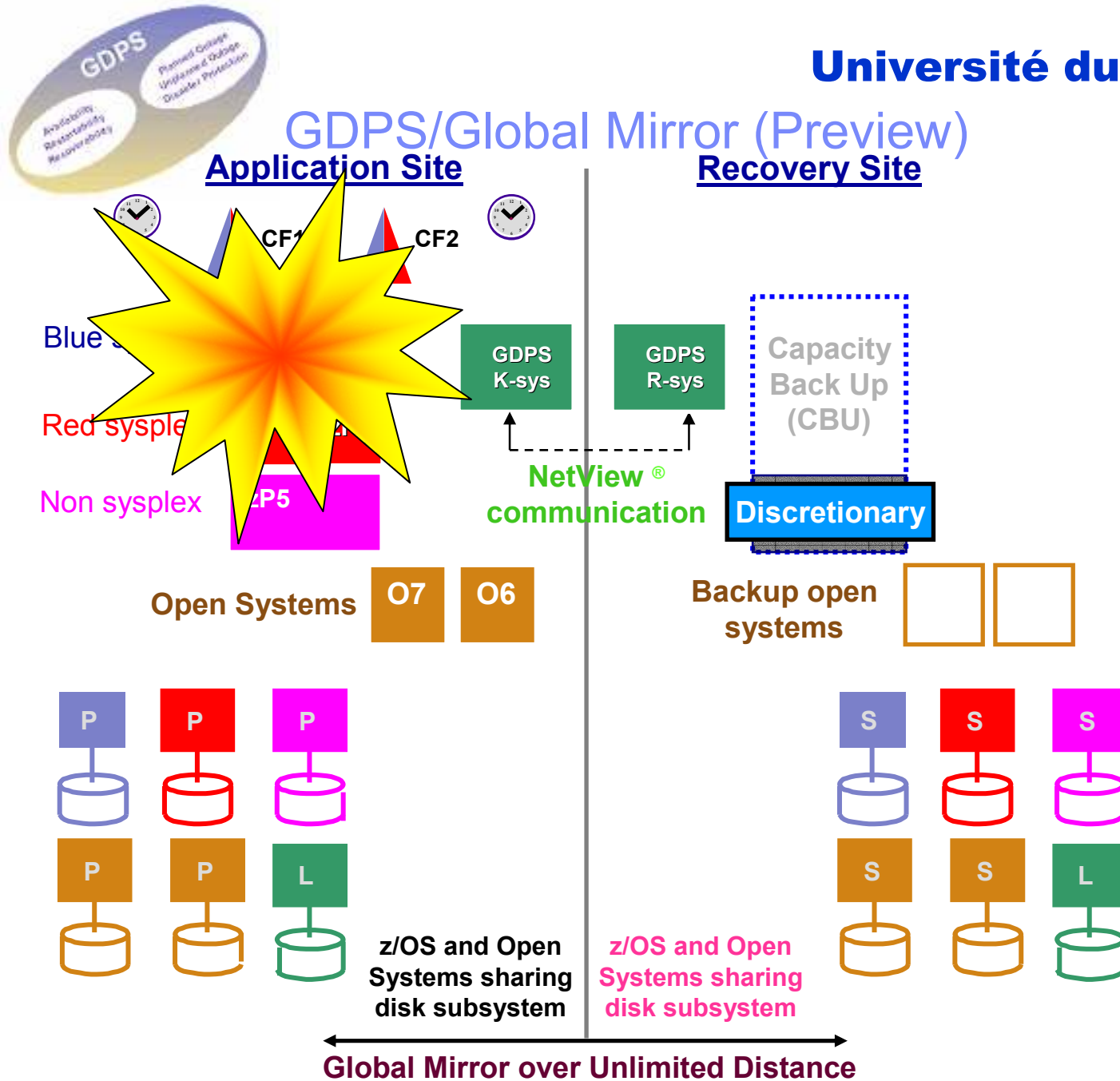
- **Global Distance:** Two-site, unlimited distance, data consistent asynchronous disk mirroring
- **Heterogeneous:** Data can span System z9, zSeries and open systems data, and can contain a mix of System z9, zSeries and open systems data
- **Scalability:** Consistency Group supported across up to 17 total IBM TotalStorage Enterprise Storage Server® (ESSs) in Global Mirror session (with RPQ)
- **Flexibility:** Many possible configurations
- **Application Performance:** Native
- **Mirroring Performance:** Two ESS Fibre Channel disk mirroring links per ESS sufficient for almost all workloads

Intended Benefits

- **Autonomic:** No active external controlling software required to form consistency groups
- **Saves cost:** No server cycles required to manage consistency groups
- **Lowers TCO:** designed to provide improved performance, global distances, and lower costs

* All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

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- Application site can have single z/OS systems, Open systems, systems in a Sysplex
- All data (z/OS and Open Systems) is planned to be mirrored using Global Mirror
- K-sys activities
 - Manages multiple Global Mirror sessions
 - Sends device info, scripts, alerts to R-sys
- R-sys activities:
 - Secondary disk recovery, CBU activation, activate backup LPARs, IPLs systems.

Phase1 : z/OS data

Phase2 : Open data

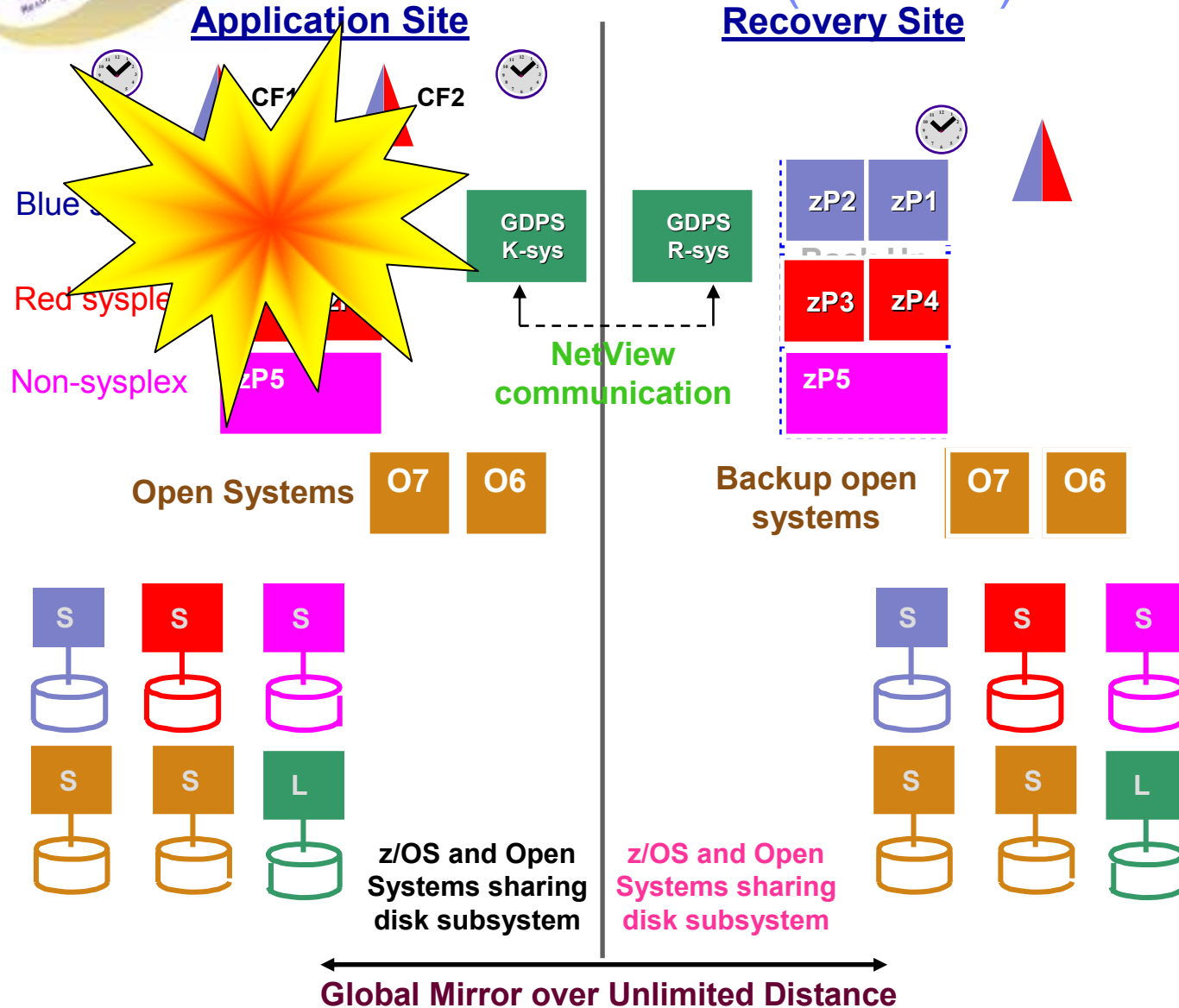
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GDPS/Global Mirror (Preview)



- RTO < 2 hours
- RPO < 5 seconds
 - (depends on bandwidth)

Phase1 : z/OS data

Phase2 : Open data

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Remote Copy Management Facility / PPRC

- Central point of control - full screen
 - Global PPRC configuration awareness
 - Functional, tree-structured interface
 - TSO commands not needed
- Initialize & maintain Remote Copy configuration
 - Single keystroke function invocation
 - Initiate functions per pair, subsystem or all
 - Automatically establish target configuration at system startup
 - Supports adding, moving, removing pairs, subsystems, links
 - (RCMF does not manage secondary consistency)
- User-initiated status & exception reporting
- Runs as a NetView application - SA for z/OS not required

Manage remote copy configurations vs. remote copy pairs



Remote Copy Management Facility / XRC

- Central point of control - full screen
 - Functional, tree-structured interface
 - TSO commands not needed
- Initialize & maintain Remote Copy configuration
 - Single keystroke function invocation
 - Initiate functions per pair, subsystem or all
 - Automatically establish target configuration at system startup
 - Supports adding, moving, removing pairs, subsystems, links
- User-initiated status & exception reporting
- Runs in System Data Mover system and controls single SDM
 - Single SDM can handle 1000-2000 3390-3 pairs
- z/OS executing in 31-bit mode)
- Runs as a NetView application - SA for z/OS not required

***Manage remote copy configurations vs. remote copy pairs
XRC (with RCMF) provides a valid D/R solution***



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Planned Enhancements

- **GDPS/PPRC HyperSwap extensions**
 - IOS Timing Trigger (GDPS 3.2)
 - Disk Subsystem Granularity within data center (GDPS 3.3)

- **GDPS/PPRC Enhanced Recovery (GDPS 3.3)**

- **GDPS/XRC support for XRC+**
 - System Logger Enhancements (GDPS 3.3)

- **Unlimited distance solution for zSeries and Open data**
 - Continuous Availability/Disaster Recovery (3 sites)
(Metro / Global Mirror)

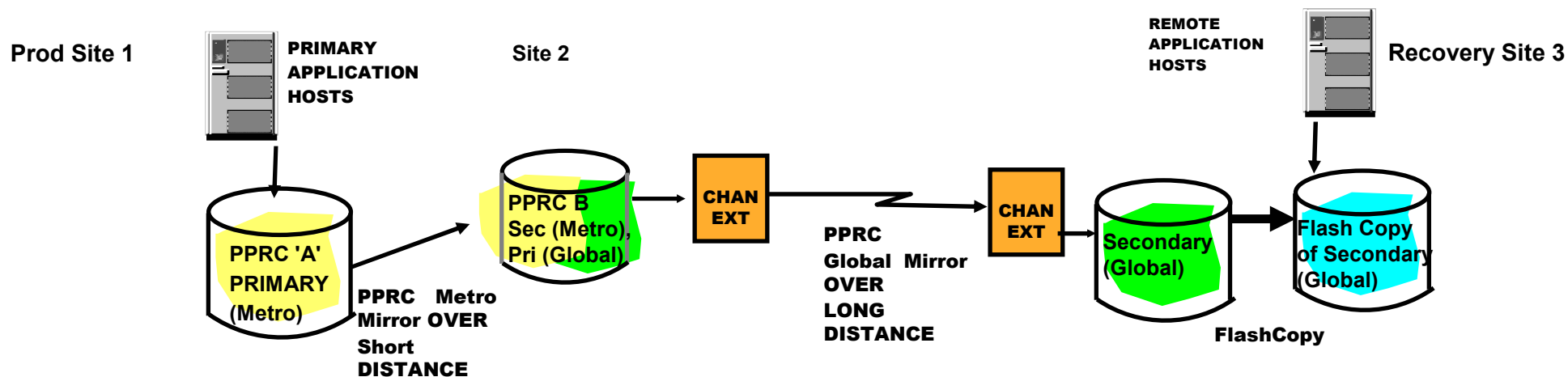
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GDPS Metro/Global Mirror –
Solution for zSeries and Open - Designed to provide
CA and D/R at virtually unlimited distance



◀ **Near-Continuous Availability** ▶

- Designed to provide continuous availability and no data loss between sites 1 and 2
- Sites 1 and 2 can be same building or campus distance to minimize performance impact

Disaster/Recovery ▶

- Production site 1 failure
 - ▶ Site 3 can recover with no data loss in most instances
- Site 2 failure
 - ▶ Production can continue with site 1 data (A)
- Site 1 and 2 failure
 - ▶ Site 3 can recover with minimal loss of data

GDPS Managed coordinated solution for zSeries and open systems

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GDPS Solutions - Synchronous

Continuous Availability of Data (Single Site)

Solution	Target Customer	Value
GDPS/PPRC HyperSwap Manager (Single site)	Parallel Sysplex	Continuous Availability of Data

Metropolitan Distance CA/DR (2 sites)

Solution	Target Customer	Value
RCMF/PPRC	Disk Mirroring	PPRC Management Ease of Use
GDPS/PPRC HyperSwap Manager	Entry Level Disaster Recovery (DR)	Planned & Unplanned reconfiguration RPO=0; RTO depends on customer automation
GDPS/PPRC Sysplex/PPRC across 2 sites Prod systems in same site or Prod systems in 2 sites)	DR for zSeries and Open Data Continuous zSeries Data availability	Planned & Unplanned reconfiguration RPO=0; RTO< 1 hr
GDPS/PPRC BRS configuration Sysplex in one site PPRC across 2 sites	DR for zSeries and Open Data	Planned & Unplanned reconfiguration RPO=0; RTO< 4 hrs





GDPS Solutions - Asynchronous

Unlimited Distance D/R (2 sites)

Solution	Target Customer	Value
RCMF/XRC	Disk Mirroring	XRC Management Ease of Use
GDPS/XRC	DR (zSeries Only)	Site failover RTO = 1-2 hrs: RPO < 2 min
GDPS/Global Mirror (1)	DR (zSeries & Open data)	Site failover RTO = 1-2 hrs ; RPO < 5 secs

CA/DR 3 sites (Metro + Unlimited Distance)

Solution	Target Customer	Value
GDPS/PPRC & GDPS/XRC (z/OS data only)	Economically essential businesses; Ultimate Bus Continuity	Metro distance CA for zSeries data & unlimited distance DR
GDPS Metro/Global Cascading (2) (z/OS & Open Data)	Economically essential businesses; Ultimate Bus Continuity	Metro distance CA & unlimited distance DR



(1) Not announced - 2Q05 target
(2) Not announced - 4Q05 target



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Positioning GDPS/XRC vs. GDPS/Global Mirror

Metric	GPDS/PPRC 	GDPS/XRC 	GDPS/Global Mirror
Performance Impact	Synchronous. Writes sensitive to distance	Asynchronous. No application impact	Asynchronous. No application impact
Distance	<= 100 Km (Fiber)	Virtually unlimited distance	Virtually unlimited distance
Data	zSeries & Open Data	zSeries Data <ul style="list-style-type: none"> • z/OS, z/VM, VSE, • Linux for zSeries LPAR or Guest 	zSeries & Open Data
Management Cost	None	Requires additional MIPS on secondary site to support SDMs	Requires additional storage for FlashCopy version
Secondary Consistency	Managed by Freeze function	Managed by SDM (z/OS)	Managed by disk subsystem and FlashCopy
Recovery	RPO = 0 (option) RTO = < 1 hr	RPO = seconds RTO = < 2 hr	RPO = seconds RTO = < 2 hr
Scalability	Highly scalable	Highly Scalable with coupled SDMs	Max 8 disk subsystems in configuration (current support)



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Summary

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- Flexible configuration options to meet a wide-range of Business Continuity requirements
 - Near-Continuous Availability of data within a single site – HyperSwap Manager
 - Solutions to handle distributed applications
 - GDPS/PPRC Open LUN Management
 - GDPS/PPRC Multi Platform Resiliency for zSeries
- In case of disaster
 - Designed to enable data consistency and integrity
 - No data loss (GDPS/PPRC) or
 - Minimal data loss (GDPS/XRC, GDPS/GM)
 - Offers prompt, responsive disaster recovery through end-to-end automation
- GDPS/PPRC addresses both Disaster Recovery and Near-Continuous Availability
 - Based on uninterrupted data availability through HyperSwap
- Simplifies routine management of systems, disk subsystems and data mirroring
 - Single point of control
 - Covering z/OS, z/VM, VSE/ESA, Linux and other Open Systems platforms
 - Removes stress from software, hardware or site facilities maintenance
- Solution is application independent
- GDPS functions will continue to be enhanced to support the On Demand Business Resiliency Framework



Business Continuity Services Offerings

■ GDPS Technical Consulting Workshop (TCW)

- Designed to ensure the GDPS Availability & Recovery solution will meet the Client's business requirements as they relate to continuous availability and recovery. The workshop will look at the site-to-site connectivity necessary to implement GDPS and identify the high level tasks that will be needed to implement.

■ Business Continuity Solution Workshop

- This program is designed to introduce the elements of IBM's products and services that form a Business Continuity Solution. Your time will be divided between interactive presentations tailored to your specific requirements and "hands on labs" that allow you to actually experience the capabilities of each element. Over the course of three days at our Washington System Center you will explore topics such as: Disk and Tape Copy Services, Network Options, Server Considerations, System Performance Planning, and Implementation Services.

■ BCRS Business Continuity Health Check

- The Health Check is an independent review that creates an action plan addressing continuity issues such as existing capabilities, costs, future technology, and resource requirements.

■ I/O Bandwidth Analysis

- IBM will use trace data collected from the customer environment to determine the requirements to configure and implement Remote Copy. IBM will create a written report of the I/O Sizing and Bandwidth Analysis of your existing environment. The report will include an analysis of your full mainframe DASD environment, as well as an analysis of a subset of that environment representing the minimum DASD required to support Remote Copy.



Additional Information

- **Detailed GDPS Presentation and Information e-mail:**
 - gdps@us.ibm.com
- **White Papers:**
 - *Business Continuity Considerations and the IBM eServer zSeries*
 - *GDPS - The Ultimate e-business Availability Solution*
- **Publications:**
 - *GDPS Family of Offerings - Introduction to Concepts and Capabilities* – SG24-6374-00
 - *TotalStorage Disaster Recovery Solutions Redbook* – SG24-6547-01
 - *z/OS Advanced Copy Services* – SC35-0428
 - *ESS Copy Services on zSeries Redpiece* - SG24-5680
 - *ESS Copy Services on Open Redpiece* – SG24-5757
- **TotalStorage Business Continuance Sales Kit**
- **GDPS Services Offerings**
 - GDPS Announcement
 - GDPS/XRC Announcement
- **Business Continuity and Recovery Services**
- www.ibm.com/servers/eserver/zseries/gdps.html



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End of Presentation