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## Business Continuity and GDPS An introduction

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## Agenda

- **Business Continuity Basics and GDPS Solutions at a glance**
- **GDPS Solutions : some more “details”**

## Business Continuity

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.

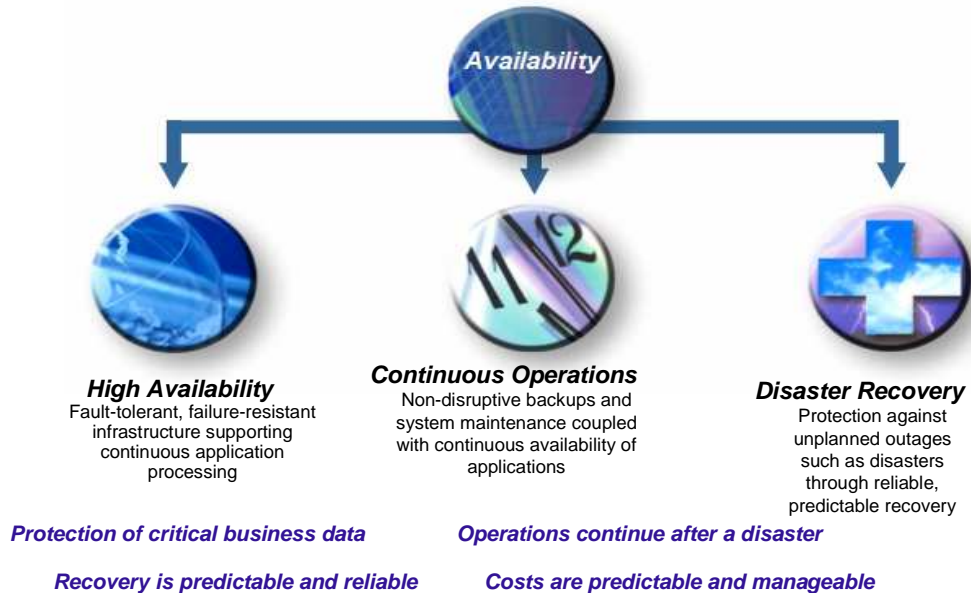
- Effective Business Continuity depends on ability to:
  - Reduce the risk of a business interruption
  - Stay in business when an interruption occurs
  - Respond to customers
  - Maintain public confidence
  - Comply with requirements:
    - Audit
    - Regulator/Legislative
    - Insurance
    - Health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



People    Facilities    Business Processes    Infrastructure    Applications

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

## Aspects of Availability



## Lessons Learned About IT Survival

- Repeated Testing before a disaster is crucial to successful recovery after a disaster
  - Test The Way You Recover
  - Recover The Way You Test
- 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

## Business Continuity : steps to get started

1. Determine your business continuity objectives:
  - a) Recovery Time Objective (**RTO**) : How long can you afford to be without your systems?
  - b) Recovery Point Objective (**RPO**) : How much data can you afford to recreate when systems are recovered?
  - c) Network Recovery Objective (**NRO**) : How long to switch over the network?
2. Select either synchronous or asynchronous remote copy technologies to meet business continuity objectives:

### SYNCHRONOUS Remote Copy

Helps achieve goal of continuous data availability. Use when:

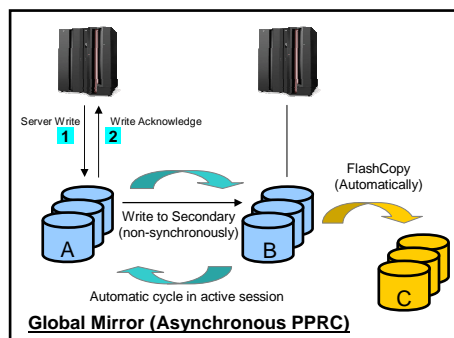
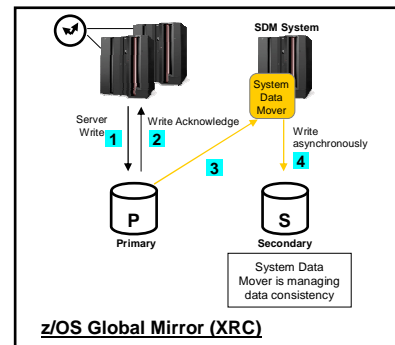
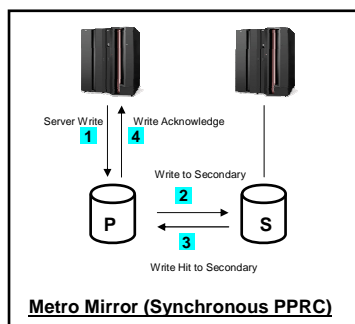
- **Response time impact** is acceptable
- Within **metro distance**
- **No data loss** is the objective
- **Fastest recovery time** is required.

### ASYNCHRONOUS Remote Copy

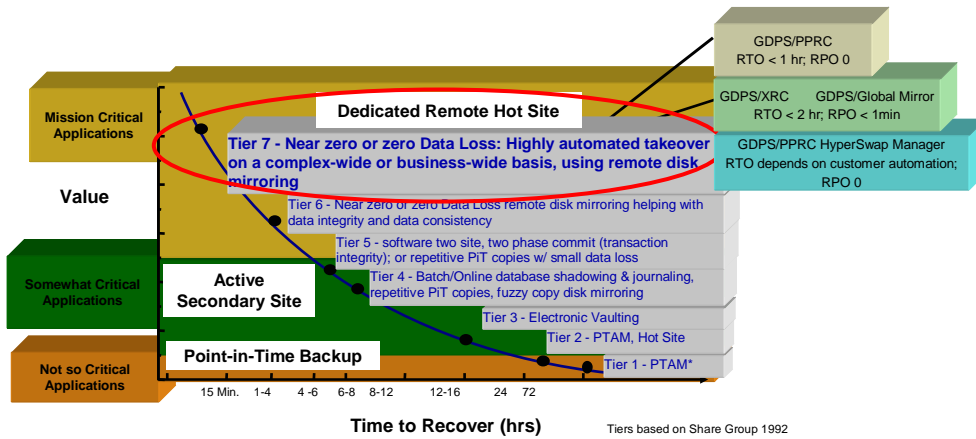
Helps achieve goal of extended distance disaster recovery. Use when:

- **Smallest possible response time impact** to primary site performance is required
- **Extended distance** disaster recovery is the objective
- **Minimal data loss** is acceptable.

## GDPS supported Remote Copy solutions



## Tiers of Disaster Recovery: Level Setting GDPS

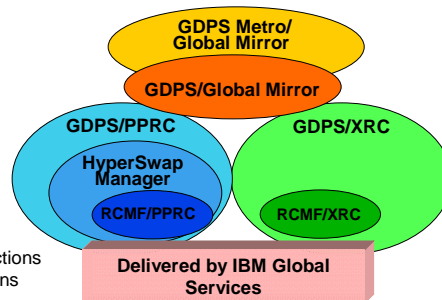


Tiers based on Share Group 1992  
\*PTAM = Pickup Truck Access Method

**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**

## What is GDPS?

- **Integrated automated solution that manages application and/or data availability in and across sites**
  - Builds on proven high availability technologies
    - Clustering
    - Remote Copy (Disk (PPRC, XRC, Global Mirror) and Tape (PtP VTS))
    - Automation
- **Manages both planned and unplanned exception conditions**
  - System or site maintenance
  - System or site failure
  - D/R validation testing using PIT copy
- **Continuous availability possibilities**
  - With HyperSwap technology
- **Easy to use End-User interface through**
  - Intuitive Panel Interface - status and planned actions
  - Simple Scripting - planned and unplanned actions
- **Delivered as a solution offering by IBM IGS**
  - Consultancy and experience sharing
  - Synergistic implementation approach
- **Flexible options to meet a variety of requirements**



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

## 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 < 1 min
GDPS/Global Mirror	DR (zSeries & Open data)	Site failover RTO = 1-2 hrs ; RPO < 1 min

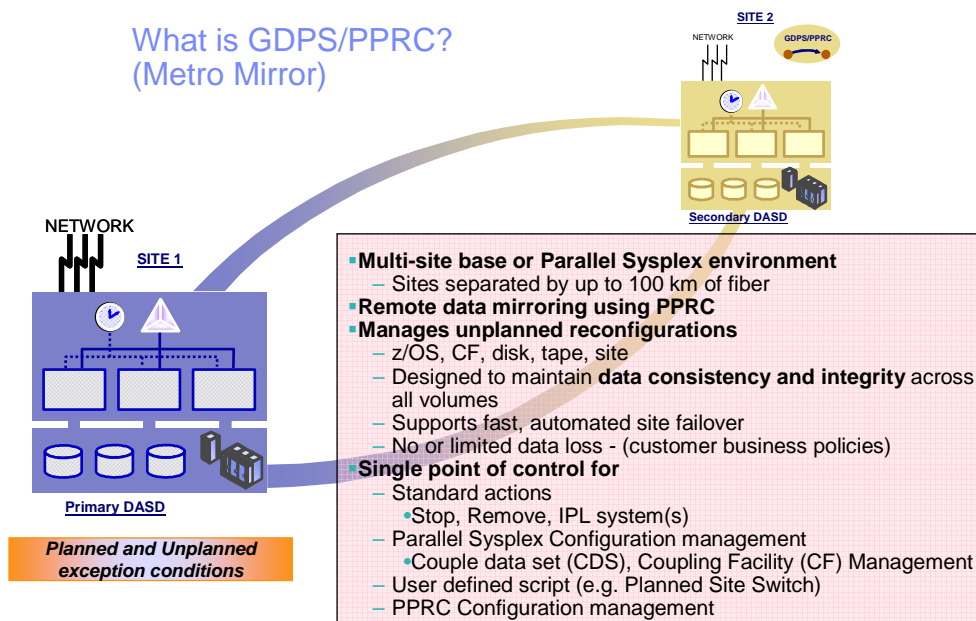
### CA/DR 3 sites (Metro + Unlimited Distance)

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 (z/OS & Open Data)	Economically essential businesses; Ultimate Bus Continuity	Metro distance CA & unlimited distance DR

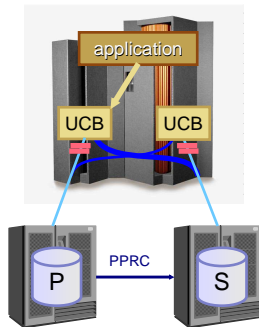
## Agenda

- Business Continuity Basics and GDPS Solutions at a glance
- **GDPS Solutions : some more “details”**

## What is GDPS/PPRC? (Metro Mirror)



## GDPS/PPRC HyperSwap – the Technology



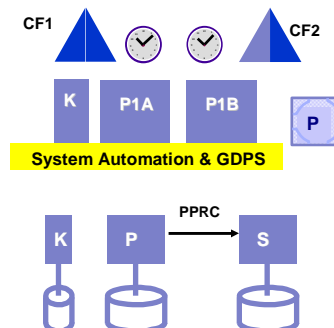
- Extends Parallel Sysplex availability to disk subsystems
- Masks *primary disk subsystem failures* by transparently switching to use secondary disks
- Provides ability to perform disk maintenance and planned site maintenance without requiring applications to be quiesced
- Swaps large number of disks 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**

## GDPS/PPRC HyperSwap Manager

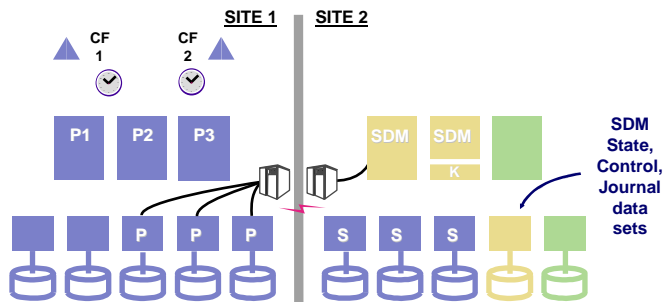
**Maximum resilience for z/OS data in a single site  
Entry-level disaster recovery across two sites**

- **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 / XRC Long distance failover for zSeries only



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

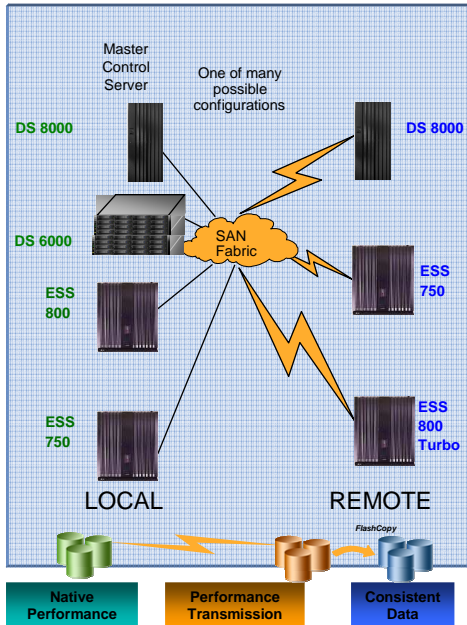
SDM  
State,  
Control,  
Journal  
data  
sets

- **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

## GDPS/PPRC and GDPS/XRC other supported functions

- **GDPS/PPRC**
  - Management of Open systems LUNS
  - Multi Platform Resiliency for zSeries
    - Coordinated near-continuous availability and DR solution for z/OS and Linux guests running under z/VM
- **GDPS/PPRC and GDPS/XRC Common Functions**
  - Flashcopy Support
    - GDPS and user-initiated Flashcopy
  - IBM TotalStorage Peer to Peer Virtual Tape server (PtP VTS) Support
    - New workload mode to support GDPS : primary mode
  - GDPS/PPRC and GDPS/XRC manage Linux for zSeries

## Storage Consolidation and Disaster Recovery with IBM TotalStorage Global Mirror



### Designed to Provide:

- **Global Distance:** Two-site, unlimited distance, data consistent asynchronous disk mirroring
- **Heterogeneous:** Data can span zSeries® and open systems data, and can contain a mix of zSeries and open systems data
- **Scalability:** Consistency Group supported across up to 15 total ESSs in Global Mirror session (with RPQ)
- **Flexibility:** Many possible configurations
- **Application Performance:** Native
- **Mirroring Performance:** Two ESS Fiber 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

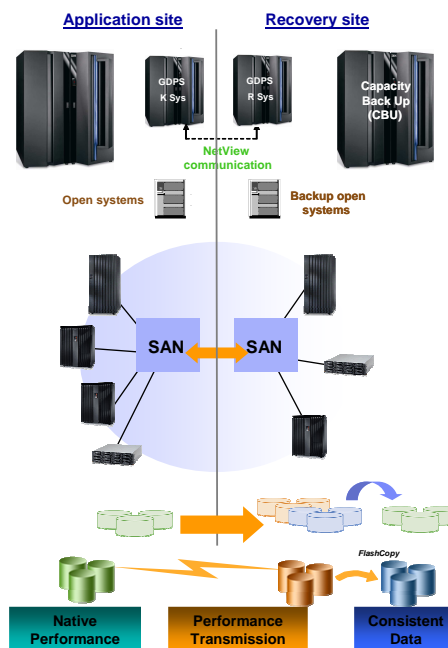
## GDPS/Global Mirror

### Features:

- Automates management of the TotalStorage Global Mirror Technology
- Manages multiple consistency groups
- Monitors the environment and reports on events that could prevent rapid recovery
- Manages the recovery of the bring up of the application at the recovery site.
- Supports recovery time objective (RTO) of less than 1-2 hours

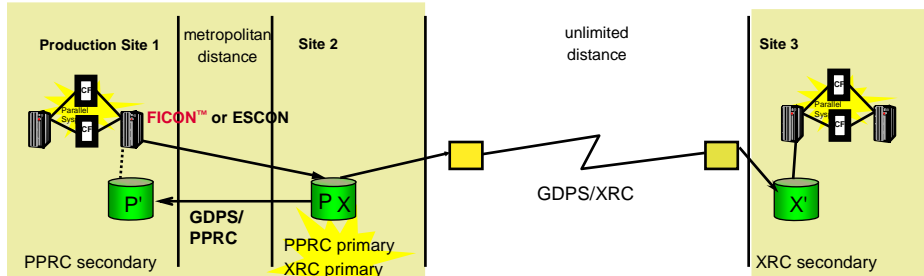
### Intended benefits:

1. Automated management of the customer's disaster recovery environment
  - a) Reduce skills required to recover
  - b) Reduce resources required to maintain the environment
  - c) Reduce time to recover
  - d) Maintain the rapid recovery capability
2. Scalable: multiple consistency groups



## Continuous Availability and Disaster Recovery at unlimited distance (GDPS/PPRC & GDPS/XRC)

### zSeries Solution



#### Continuous Availability GDPS PPRC or GDPS/PPRC HM

- 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

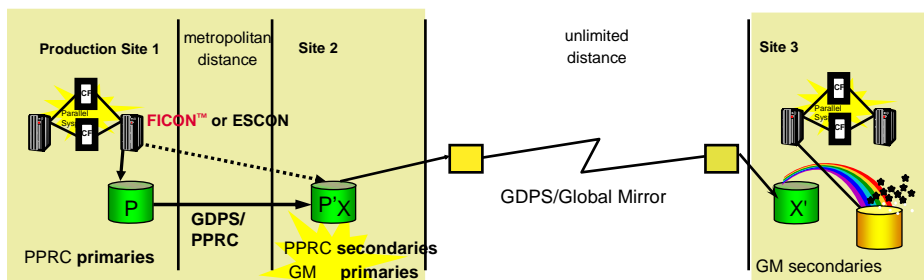
#### Disaster/Recovery

- 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

**Continuous Availability, No data loss, Unlimited Distance**

## Continuous Availability and Disaster Recovery at unlimited distance (GDPS/Metro & Global Mirror)

### zSeries and Open Solution



#### Continuous Availability GDPS/PPRC

- 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

**GDPS Managed coordinated solution for zSeries and open systems**

## RCMF

- Remote Copy Management Facility / PPRC
- Remote Copy Management Facility / XRC
  - Central point of control – full screen
  - Initialize and maintain Remote Copy configuration
  - User-initiated status and exception reporting
  - Runs as a Netview application – SA for z/OS note required

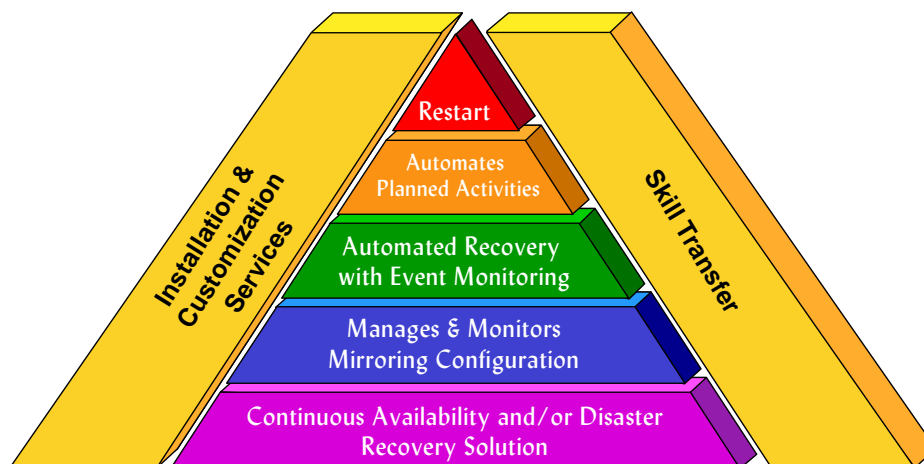
## Positioning GDPS/PPRC, GDPS/XRC, GDPS/Global Mirror

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

## Summary

- **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
- **Uninterrupted data availability with HyperSwap**
- **Simplified routine management of systems, disk subsystems and data mirroring**
  - Single point of control
  - Covering z/OS, Linux and other Open Systems platforms
  - Automates software, hardware or site facilities maintenance procedures
- **GDPS functions will continue to be enhanced to support the On Demand Business Resiliency Framework**

## GDPS offers a comprehensive solution, not just remote copy technology



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