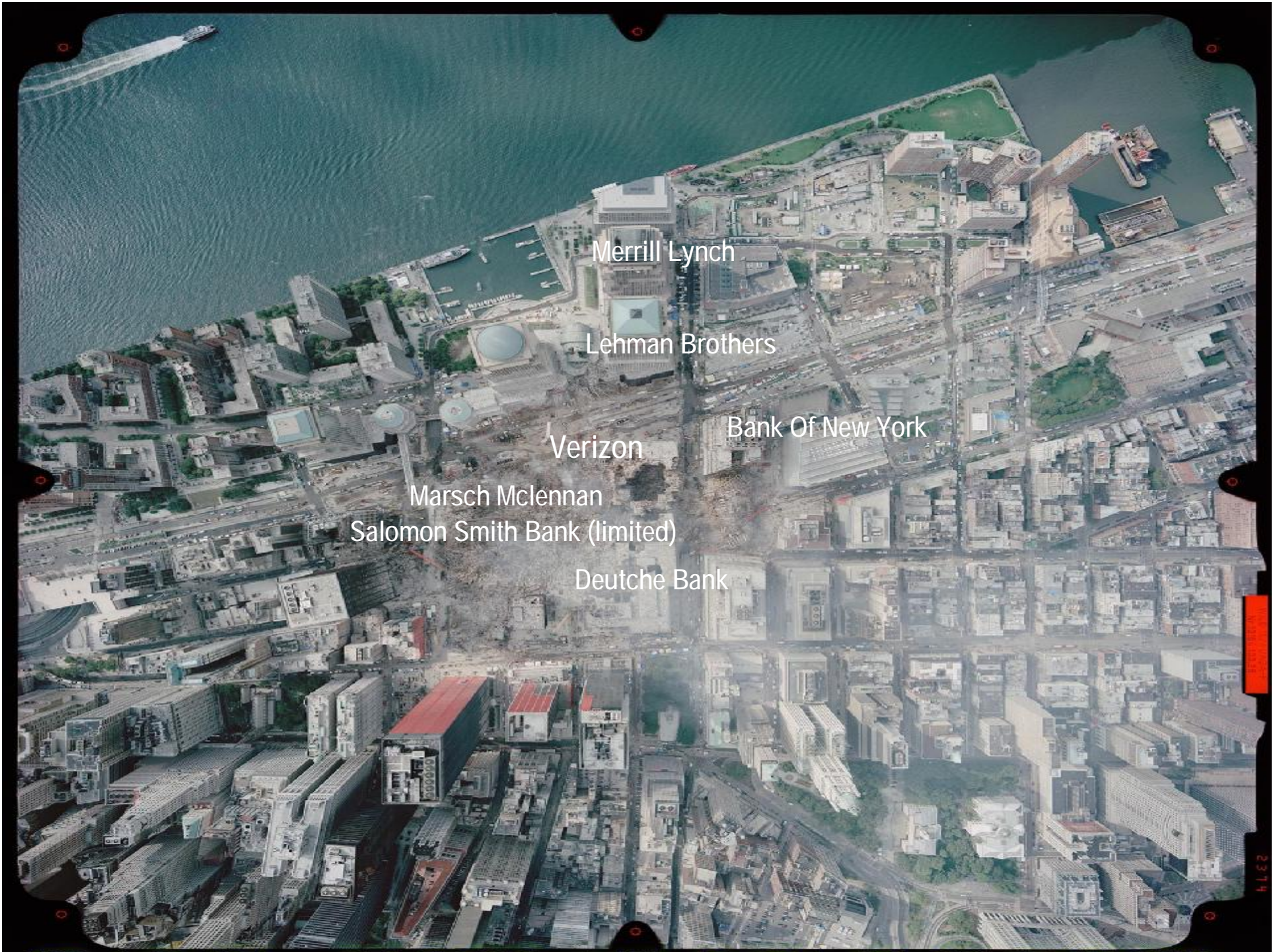


EMC助力制造业信息安全

陈开来
EMC制造业高级项目经理

- 数据安全对企业的重要性
- 选择合适的数据保全方法
 - 时间与投资的平衡
 - EMC多种数据保全方案
 - VMWare+EMC 天作之合
- 一些例子





Verizon — 设施毁损一览表

ÿ Access lines out of service (voice)		200,000
ÿ PBX / Centrex lines out of service		150,000
ÿ Data circuits out of service		3,700,000
ÿ Cell sites out of service		10
ÿ Number of customers affected:		
ÿ Business	approx.	14,000
ÿ Residential	approx.	20,000

911事件暴露出未预见的事项

ÿ Lose Of Total Facility

损失整个设施

ÿ Long Term Outage

长期中断

ÿ Transportation Paralysis

运输瘫痪

ÿ Logistic Issues

后勤支援问题

ÿ People Support Issues

人员支持问题

ÿ Lose of Key Personnel

失去关键人员

911事件：吸取的教训

知识财产

每个组织都违背了知识财产（人才）管理的基本原则

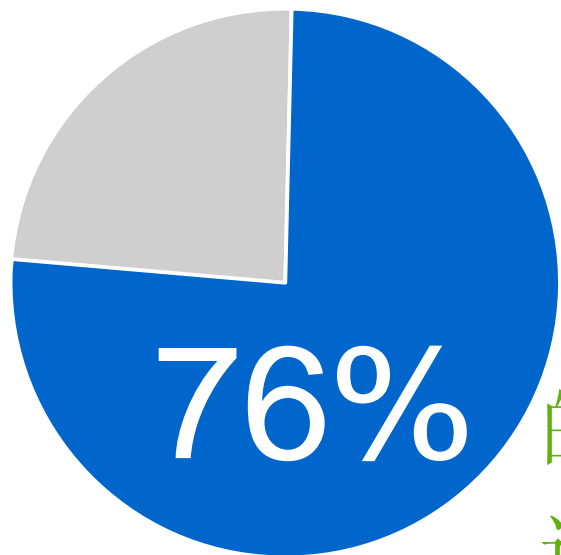
违背了在 35 年前就已存在的灾难管理“标准惯例”

Y 未能将人员的知识分散到两个或更多的地点

Y 未能各尽职责地交叉培训高级管理人员

Y 没有一个清晰的分级连续性。

Y 未能进行完全灾难演练。



的IT主管经历过严重的
设备瘫痪或关键业务中断

恰当的数据保护解决方案能帮助你最大程度地
减小由于业务中断所带来的损失

* *Building the Business Case for DR Spending, Forrester Research, N = 250, April 2008*

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CLARiION CX4 系列磁盘阵列



数据备份—恢复点目标RPO

Recovery Point Objective (RPO)



数据恢复—恢复时间目标RTO

Recovery Time Objective (RTO)

恢复时间包含：
实效检测
数据恢复
应用恢复

全局集群

手工迁移

磁带恢复



VMware
AutoStart



Replication Manager



NetWorker 备份软件

传统备份和磁带库的困境

Y 备份和恢复的性能

- 无法满足备份窗口
- 无法提供足够的恢复服务水平

Y 磁带介质的可靠性

- 库体、驱动器、机械手和带匣都有可能出现故障
- 磁带不支持RAID保护

Y 管理复杂

- 维护成本高、环境要求高

Y 磁带管理带来的风险

- 磁带遗失
- 时间都花在找磁带上
- 磁带运输的成本



EMC 有重复数据删除技术的虚拟磁带库

New DL3D 1500 and DL3D 3000

- ÿ Reliable, affordable, scalable LAN backup to disk platforms with data de-duplication
- ÿ For midsize IP environments
- ÿ Policy-based data de-duplication

DL3D 1500

Up to 720 GB/hour
Up to 36 TB (1 TB disks, RAID 6)
6 Gigabit Ethernet ports for CIFS/NFS
2 Fibre Channel SAN ports (VTL)
IP replication de-duplicated



DL3D 3000

Up to 1.44 TB/hour
Up to 148 TB (1 TB disks, RAID 6)
8 Gigabit Ethernet ports for CIFS/NFS
4 Fibre Channel SAN ports (VTL)
IP replication de-duplicated

New De-duplication Option for DL4000

- ÿ Virtual tape library backup with de-duplication for large SAN environments
- ÿ Policy-based de-duplication to reduce disk capacity requirements
- ÿ Available as an upgrade for existing DL4000 systems



DL4000 with 3D 4000

Up to 7.92 TB/hr
Up to 674 TB (1 TB disks, RAID 6)
1–2 Disk Library engines
8–16 4 Gb/s Fibre Channel ports
IP replication de-duplicated

DL4000 3D 4000

DL3D型号中的高级重复数据删除技术

子文件块级的重复数据删除

不等长文件块技术

- Captures small block inserts and overstrikes in unstructured data

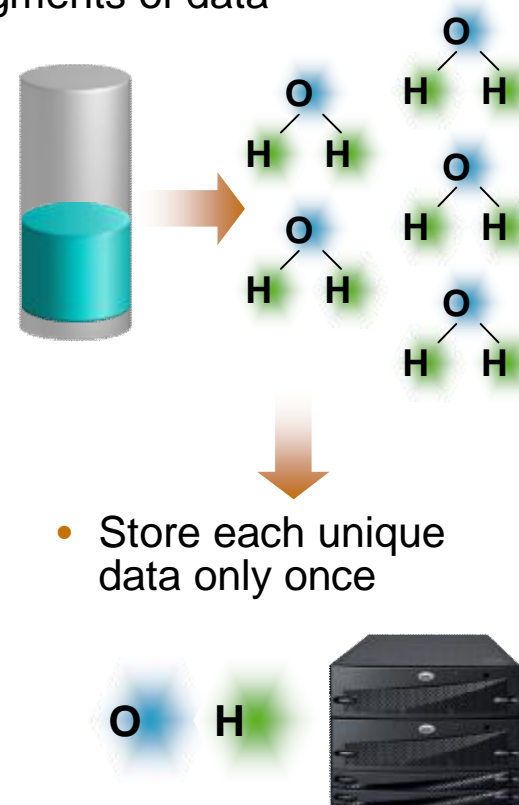
应用程序敏感

- Understands backup software metadata to optimize backup process

内置数据压缩

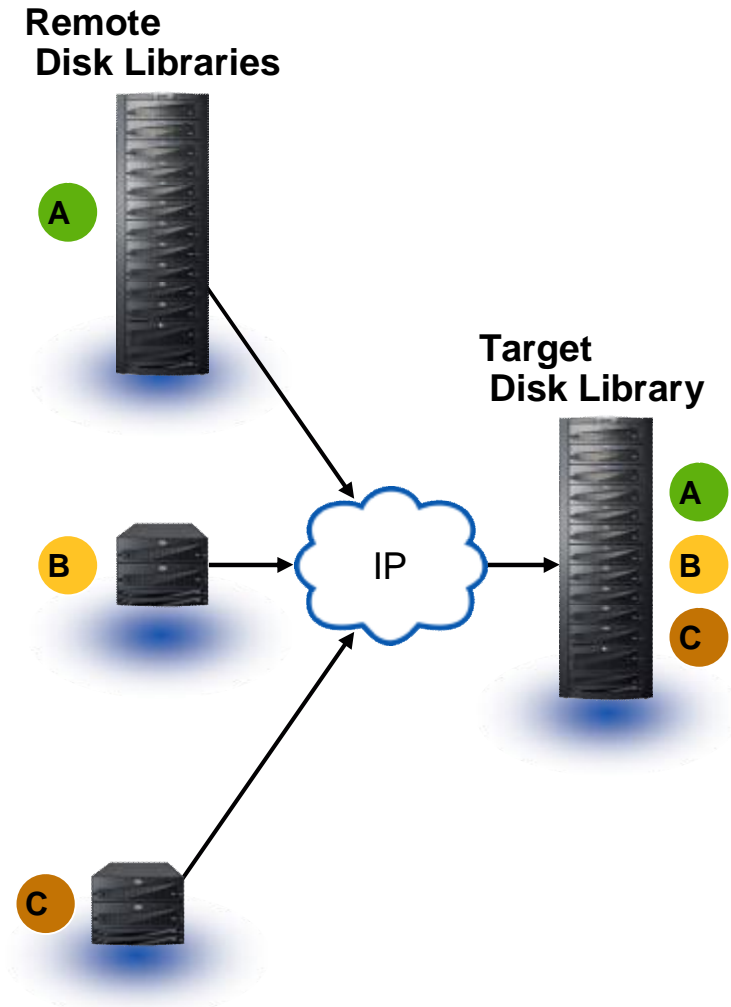
- Standard on all DL3D engines
- Compression is additive to de-duplication in terms of data reduction

Break data into sub-file, variable-length segments of data



远程自动复制—DL3D 1500, DL3D 3000

- ÿ Replicate de-duplicated backups to reduce bandwidth
- ÿ De-duplication check before replication to remote site
 - Target Disk Library validates that the data block is unique before remote Disk Library begins transmitting
 - Further reduces bandwidth
- ÿ Supports up to 10 remote locations to one target
 - Common data de-duplication repository for maximum reduction
 - Supports any combination of replication from DL3D 1500/3000 to DL3D 1500/3000
 - Bi-directional replication between systems
- ÿ Data encryption—128-bit AES
 - Ability to turn on/off
- ÿ Replicate NAS shares and/or virtual tape libraries



使数据保护更有效并可承受



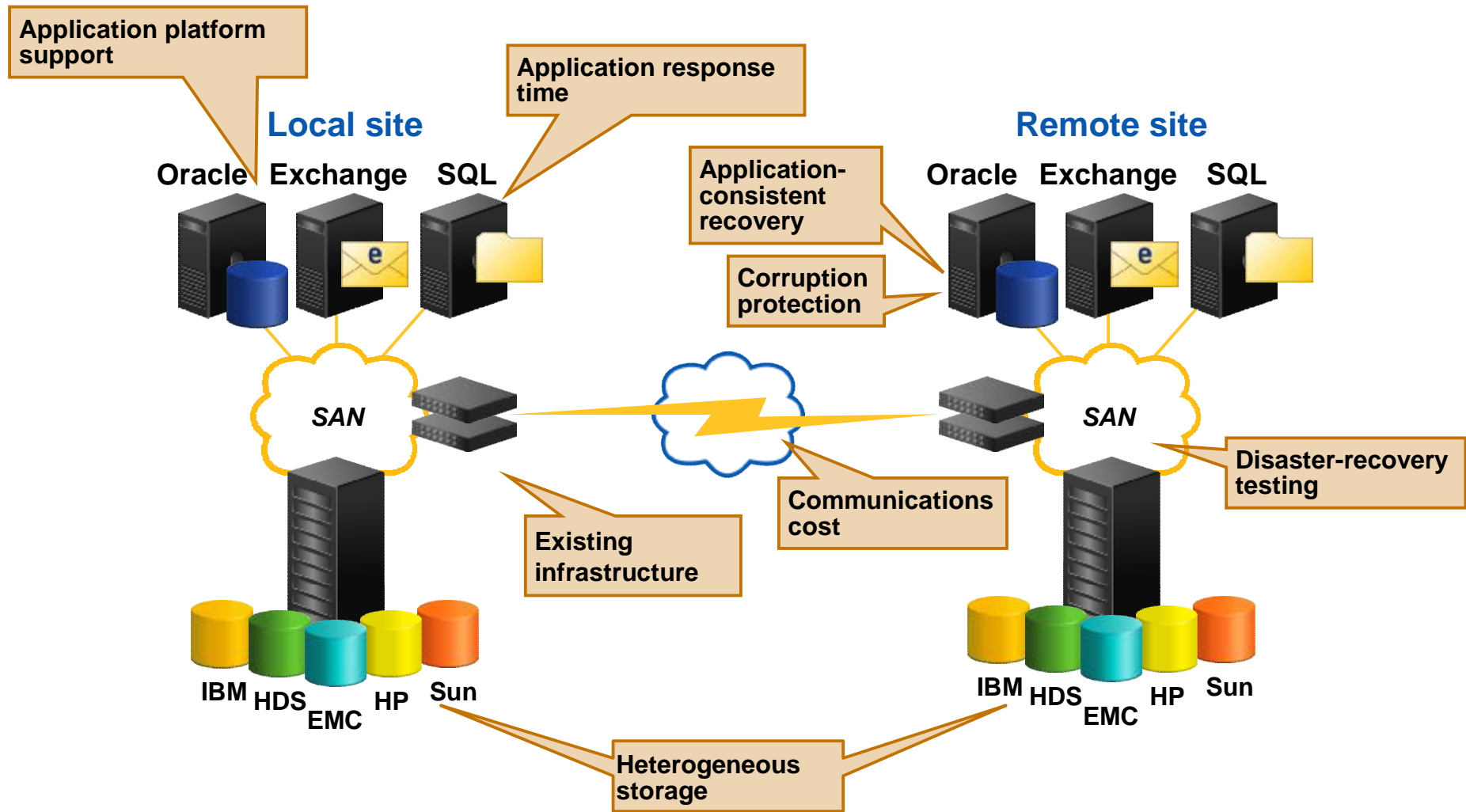
- 营业数据异常关键，不能忍受数据丢失
- 销售系统数据库结构复杂，需要每天做全备份保证可恢复性
- 异地备份机房链路成本很高，带宽有限
- IT管理人员很少，需要系统高度自动化

- EMC Networker备份软件能备份各种数据库，且完全自动化
- EMC DL3D虚拟磁带库能擦除90%以上的重复数据，大大降低每天全备份的数据量，并且支持自动化的远程数据复制
- EMC Clariion磁盘阵列用于安全、高性能的数据存储
- EMC专业服务保障系统7X24稳定运行

- 全自动化，无人值守的数据备份作业
- 擦除重复数据（擦除率大于92%），降低设备投资成本和链路运营成本
- 提高恢复速度（比传统磁带库提高30%），降低系统故障带来的损失

- 提高对业务的响应
- 整合价值链
- 消除冗余
- 挖掘SAP的所有潜力
- 支持产品创新
- 加强数据管理和同步
- 降低成本
- 变化的速度和广度
- 与业务相协调的创新能力
- 海量数据带来的复杂性
- 不同系统的集成
- 在未来支持“需求驱动的供应链”
- 地域差异
- 有限的预算

异构环境数据保护困境



Business Considerations

Cost

Functionality,
availability

Recovery time
objectives

Recovery point
objectives

Technical Considerations

Recovery and
consistency

Capacity

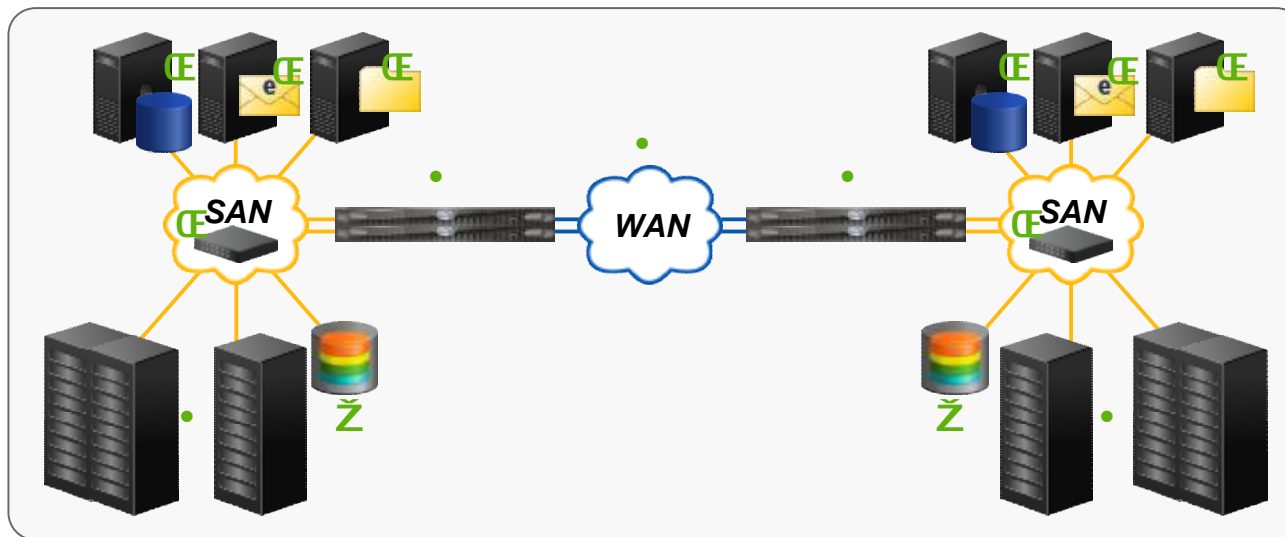
Bandwidth

Performance

PRIMARY DECISION DRIVERS



RecoverPoint 连续远程复制(CRR)



e RecoverPoint splitter drivers

- Mirrors writes to RecoverPoint appliance
- Resides on host, on CLARiiON, or in fabric

• RecoverPoint appliance

- Runs RecoverPoint software
- Performs all bi-directional replication
- Handles monitoring, management, and control
- Maintains write-order fidelity

Z Journal

- Tracks all data changes to every protected LUN
- Utilizes bookmarks for application-aware recovery

• Provides advanced functionality

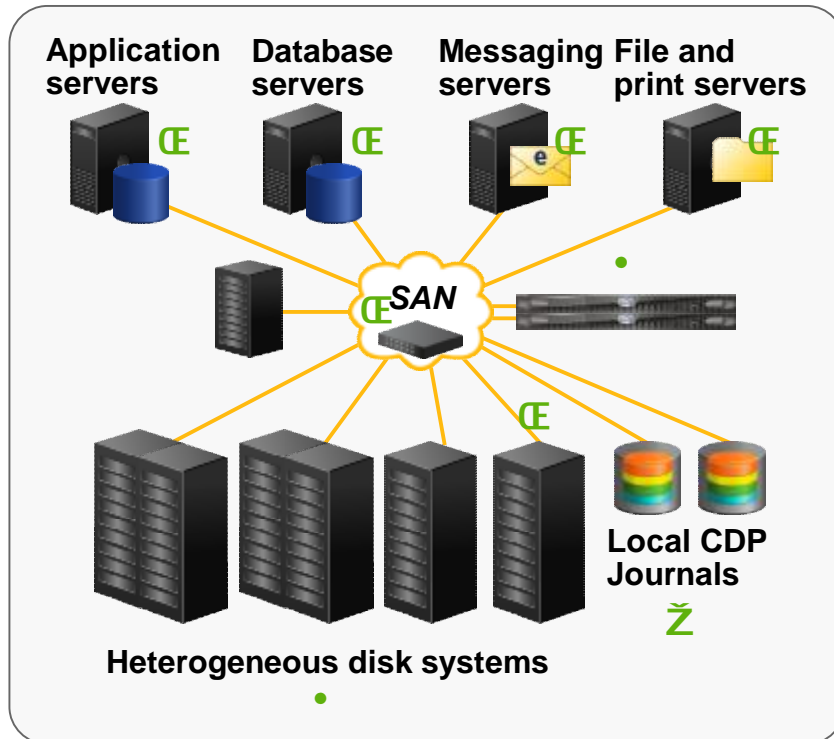
- 3–10x data compression
- No need for expensive Fibre Channel/IP converters

• Supports heterogeneous environments

- Works with EMC and third-party storage*
- True any-to-any volume replication

* Refer to the latest EMC Support Matrix on EMC.com for the complete list of supported third-party storage platforms

RecoverPoint 连续数据保护(CDP)



EMC RecoverPoint splitter driver

- Mirrors server writes to RecoverPoint appliance
- Resides on host, on CLARiiON, or in fabric

• RecoverPoint appliance

- Runs RecoverPoint software
- Writes changes to CDP Journal
- Distributes changes to target volumes
- Maintains write-order consistency across all volumes

EMC Z Journal

- Tracks all data changes to every protected LUN
- Stores bookmarks for application-aware recovery
- Stores historic data for LUNs to roll back to any point in time

• Supports heterogeneous environments

- Works with EMC and third-party storage
- Fabric splitters support Brocade Fabric Application Platform (FAP) and Cisco SANTap

高级软件功能

Y 集成CDP与CRR

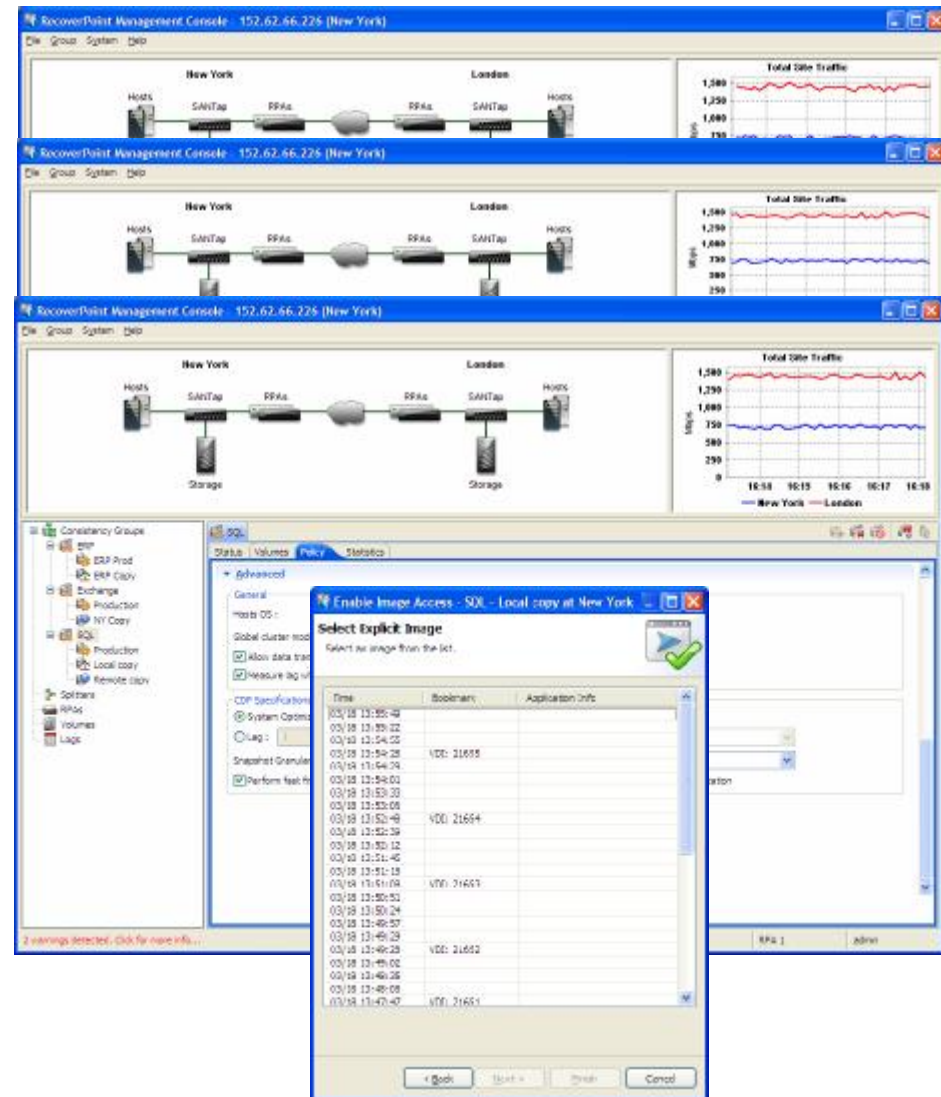
- Bi-directional replication and CDP
- Out-of-band architecture does not impact application performance
- Protect same data locally for application recovery and remotely for disaster recovery

Y 基于策略的管理

- Establish policies to manage resources
- Optimize based on differing recovery point and recovery time objectives

Y 智能恢复

- Recover to any point in time
- Application integration for recovery
- Recover local copy without impacting remote copy

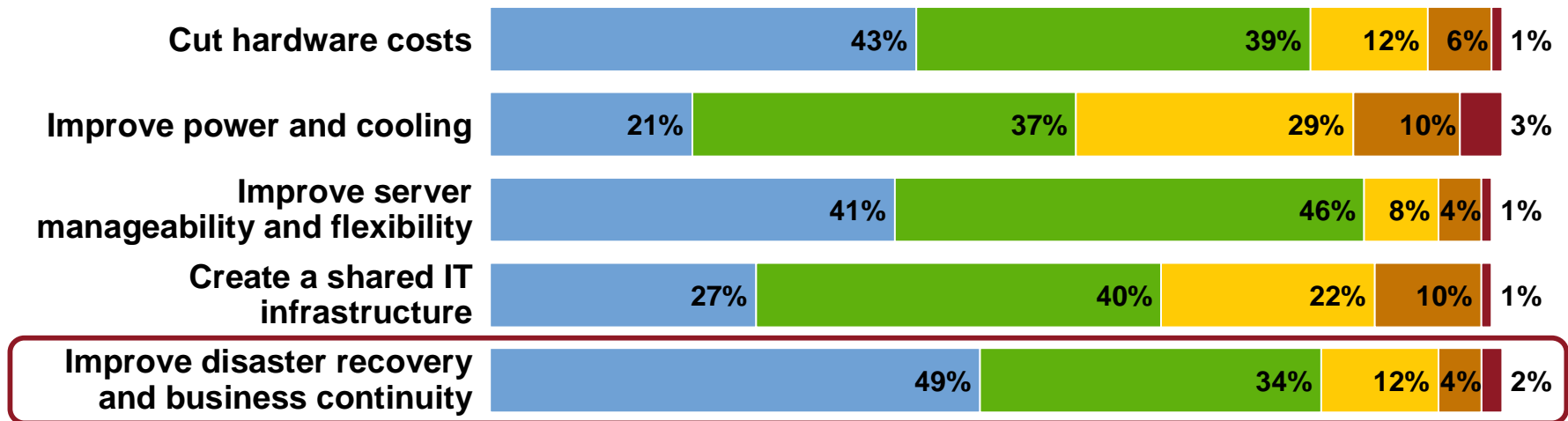


Market Dynamics— Disaster Recovery is a Top VMware Requirement



“How Important are the Following Motivations for Adopting Server Virtualization?”

■ Very important
 ■ Important
 ■ Slightly/somewhat important
 ■ Not important
 ■ Doesn't know or does not apply to me

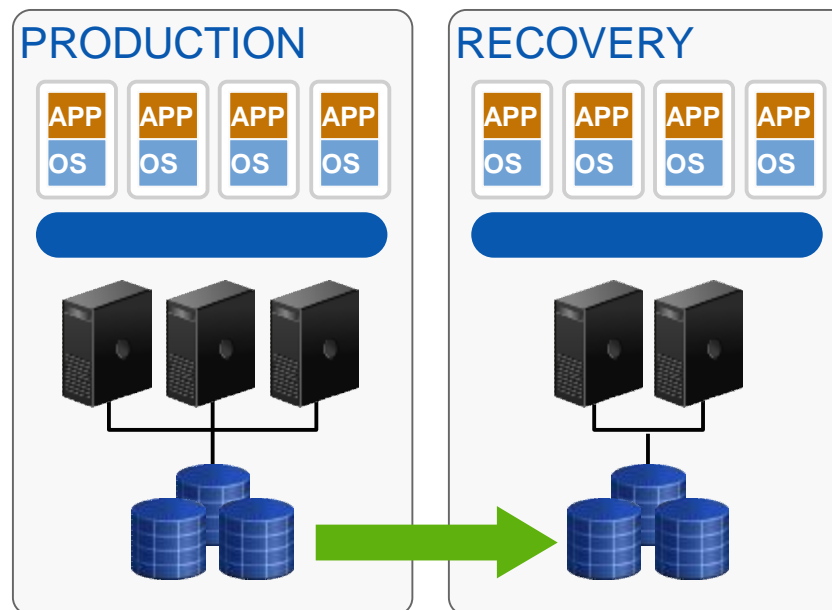


Base: 197 server decision-makers at North American and European enterprises that are interested in, are implementing in the next 12 months, or have already implemented server virtualization for x86 servers (percentages may not total 100 because of rounding)

Source: Enterprise and SMB Hardware Survey, North America and Europe, Q3 2007; Forrester Research, Inc.

VMware Site Recovery Manager 集成

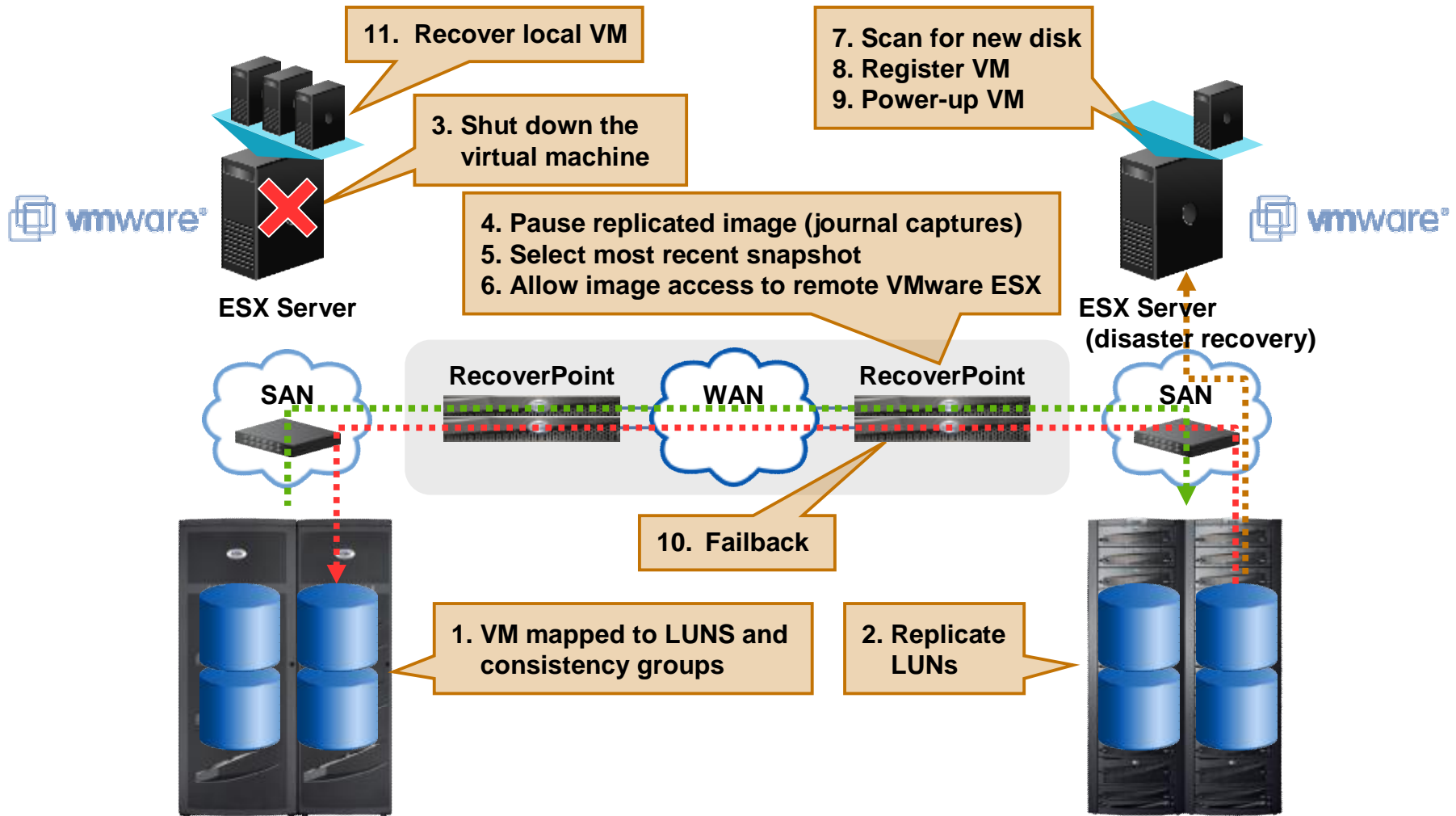
- Y Simplifies and automates disaster recovery workflows
 - Setup, testing, and failover
- Y Makes disaster recovery a property of the virtual machine [VMware High Availability (HA) and Distributed Resource Scheduler (DRS)]
- Y Provides central management of recovery plans from VirtualCenter
- Y Turns manual recovery processes into automated recovery plans
- Y Four EMC products integrated with VMware SRM
 - SRDF family
 - MirrorView
 - Celerra Replicator
 - RecoverPoint
- Y The RecoverPoint storage adapter requires RecoverPoint V3.0 (or later)



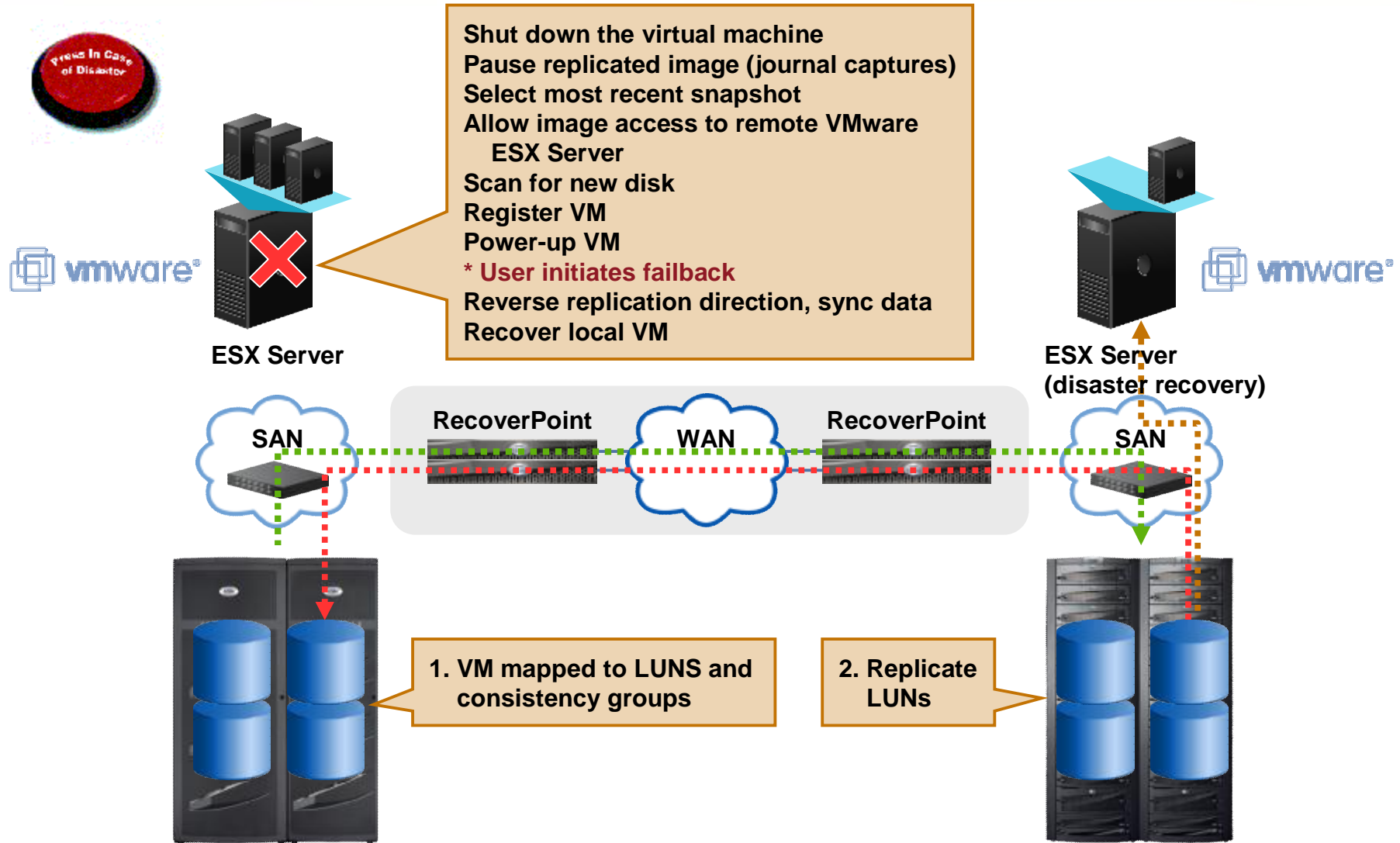
Makes disaster recovery rapid, reliable, manageable, affordable

Virtual Machine (VM) Failover Before VMware Site Recovery Manager

Manual Administrator Tasks



Virtual Machine Failover with VMware Site Recovery Manager



Why EMC is the Leader for VMware Environments

Y Shared storage

- All EMC Platforms (Fibre Channel, iSCSI, NAS)
- Virtual Provisioning, Quality of Service, Virtual LUNs, security, and ease of use

Y Backup and recovery

- NetWorker integration with VCB
- Avamar with VMware Consolidated Backup, and Avamar Virtual Edition for VMware

Y Replication

- VMware Site Recovery Manager integrated across EMC replication products

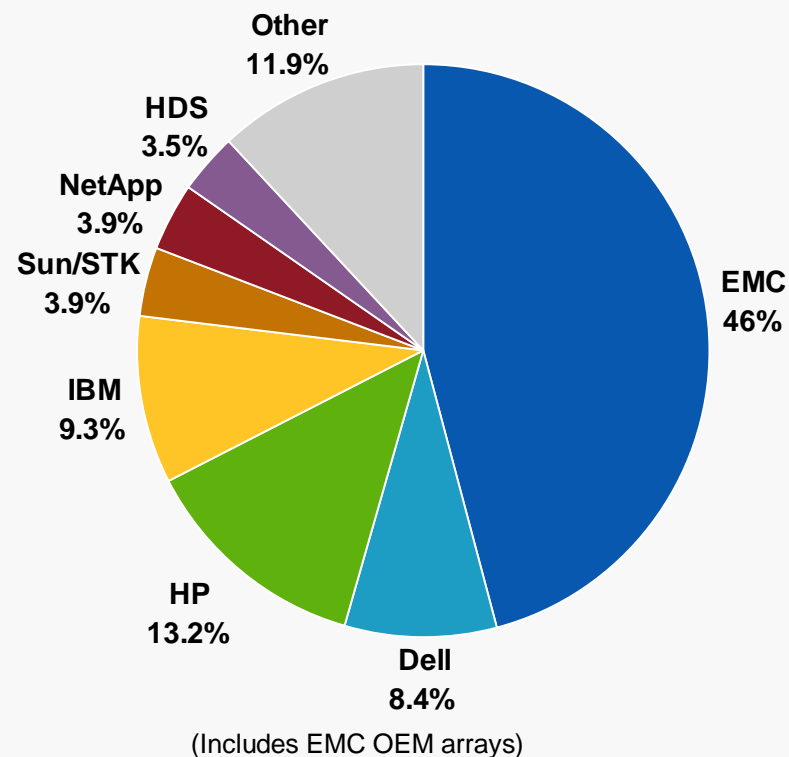
Y Resource management

- EMC ControlCenter V6.0 support for virtual machine discovery
- EMC Smarts integration and Smarts Application Discovery Manager support

Backed by EMC Reference Architectures, applied technology white papers, and supporting technical documents

IDC SERVER VIRTUALIZATION 2007 SURVEY

EMC leads all vendors as the storage platform of choice for VMware



Source: IDC—Server Virtualization (December 2007)

用户驱动的 SAP 升级

Use Case

Overview

- Y Customer planning a major upgrade of SAP ERP and CRM systems
- Y Requires viable fallback strategy for upgrade on production

Pain points

- Y Test production image in test/development lab
- Y Symmetrix DMX arrays in production, CLARiiON CX series arrays in test/development
- Y Requires iterative test upgrades to streamline process

Implementation

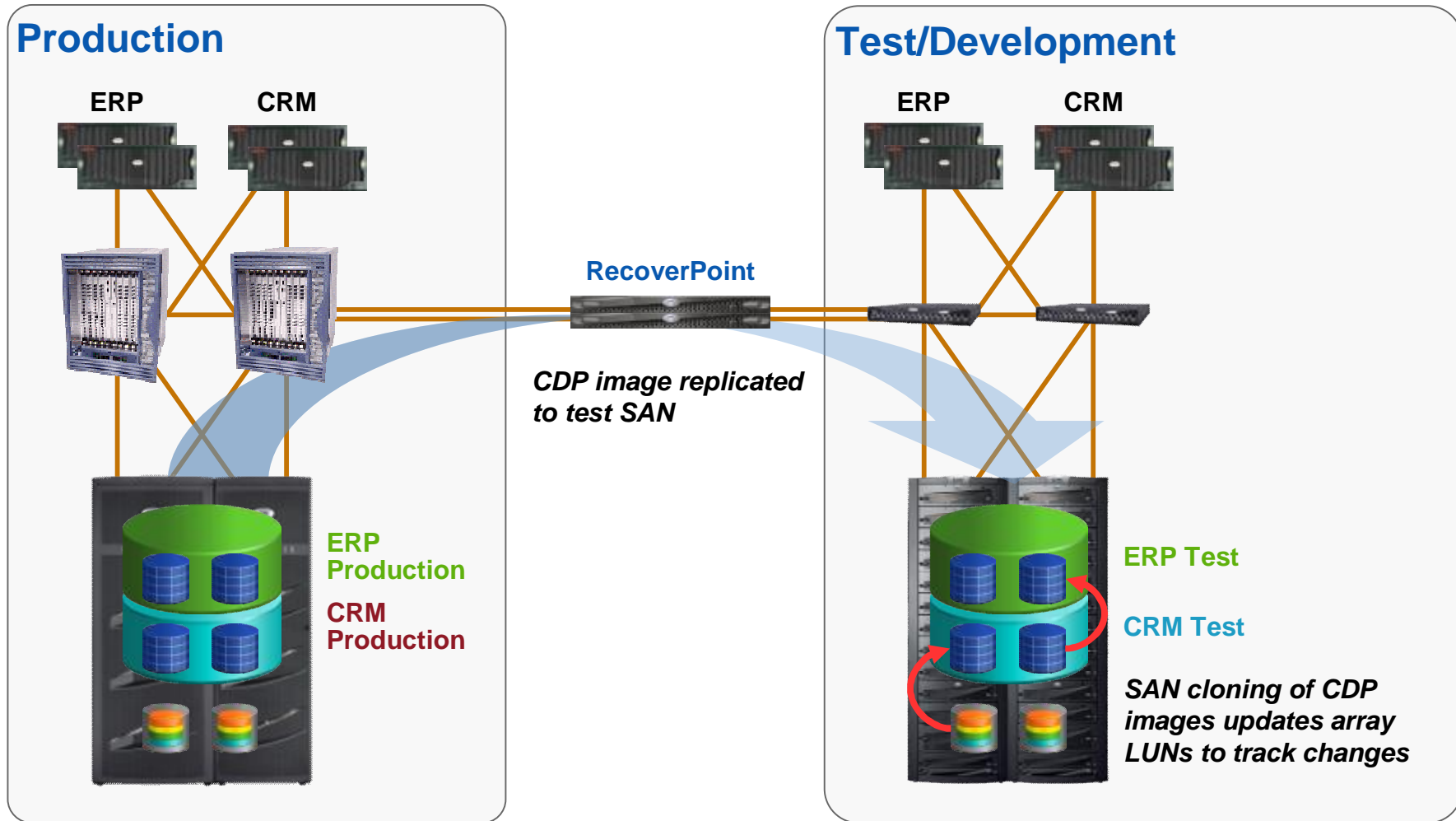
- Y Local replication with continuous data protection
- Y Replicate full copy of SAP systems to test/development
- Y Leverage logged image access to refresh test/development image clones



Customer:

Leading materials manufacturer—local replication

Customer-Driven SAP Upgrade



Local and Remote Exchange Replication with VSS and Recovery

Use Case

Overview

- 6 TB of production capacity
- Replicating across 500-mile WAN link to disaster-recovery location

Pain Points

- 15-minute recovery point objective, quarterly disaster-recovery tests, cross-host consistency
- Previously used host-based replication, performance issues

Implementation

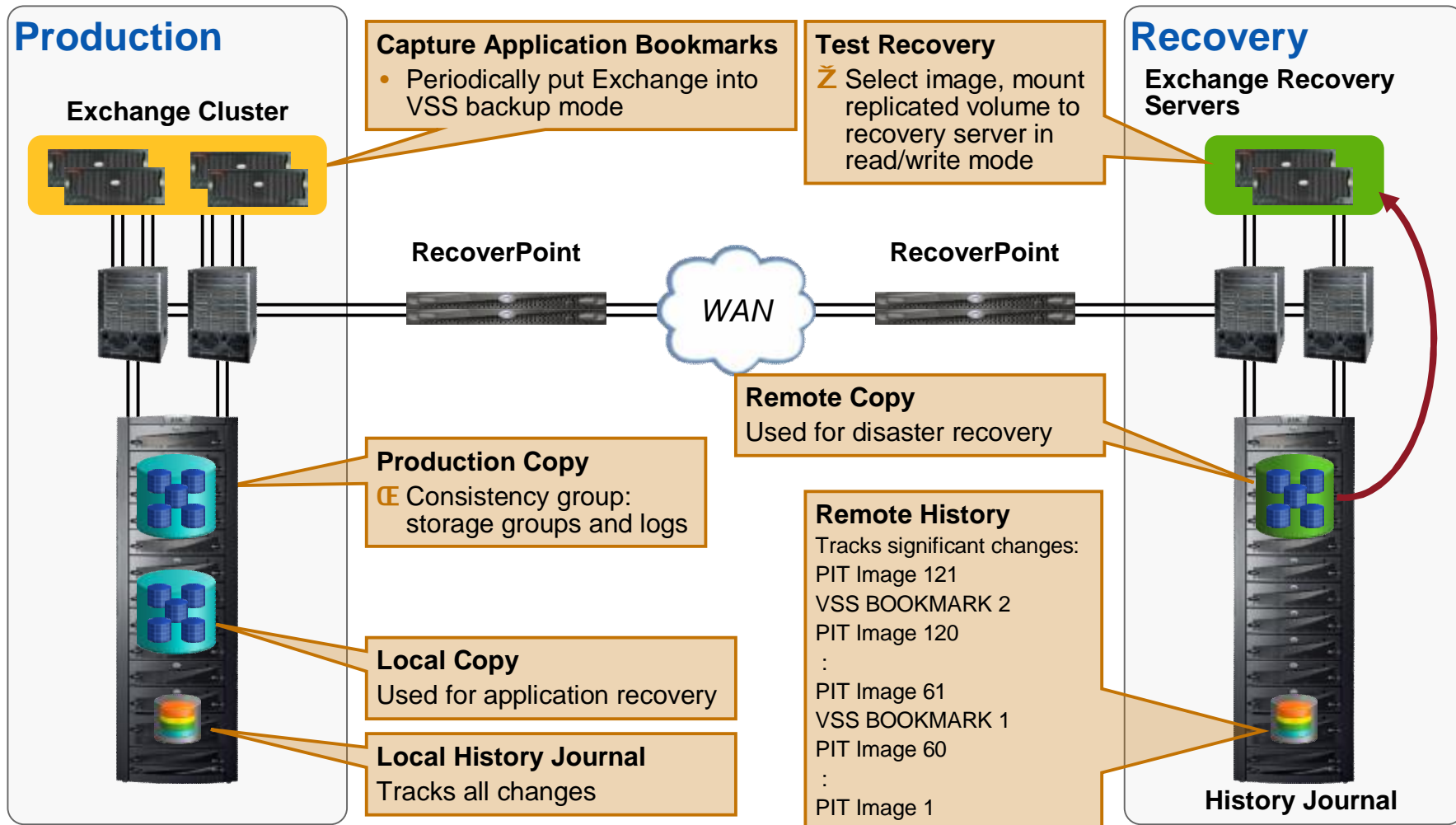
- Continuous replication, one-minute lag, hourly application consistency
- Placed storage groups and logs into single consistency group
- Used Microsoft VSS bookmarks to ensure Exchange consistency
- Leveraged logged image access to test recovery



Customer:

Large global legal firm—
asynchronous replication

Local and Remote Exchange Replication with VSS and Recovery



EMC²
where information lives[®]