



# 虛擬化儲存 解決方案

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# 簡報大綱

儲存演進史

虛擬化儲存技術剖析

備份/備援解決方案

Q & A



# 儲存演進史

2011/9/12



# 世界上第一款磁碟機RAMAC ( 1956 )

重達一噸，只能容納5MB的資料





# 儲存演進史

- 提供方便、簡易且便宜的儲存載體
- 資料壞損率高
- 效能不佳
- 空間不足

Host  
Internal  
Disk  
單顆

- Raid Card
  - 相容性不足
  - 穩定度不高
- 管理工具簡陋
- 缺乏除錯工具

Host  
Internal  
Disk  
陣列

- 高安全性資料保護
- 無法同時提供給多台前端主機使用
- 資料分享
  - 能力差
  - 伺服器效能受影響

DAS

- 獨立檔案伺服器主機
- 資料得以集中管理
- 輕易進行資料分享
- 管理、除錯工具強
- 資源使用缺乏彈性

NAS  
(CNS)  
F5 ARX

- 資料得以集中管理
- 可同時提供給多台前端主機使用
- 資料分享不易
- 效能佳
- 管理、除錯工具強
- 資源使用缺乏彈性

SAN  
(CNS)  
storageX

- 提供24小時不中斷服務
- 同時提供NAS及SAN服務
- 具有極大的靈活性
- 可跨異質儲存平台
- 單座儲存可虛擬成多座儲存

Virtual  
Storage

- 可橫向擴充



# 虛擬化儲存 技術剖析

2011/9/12



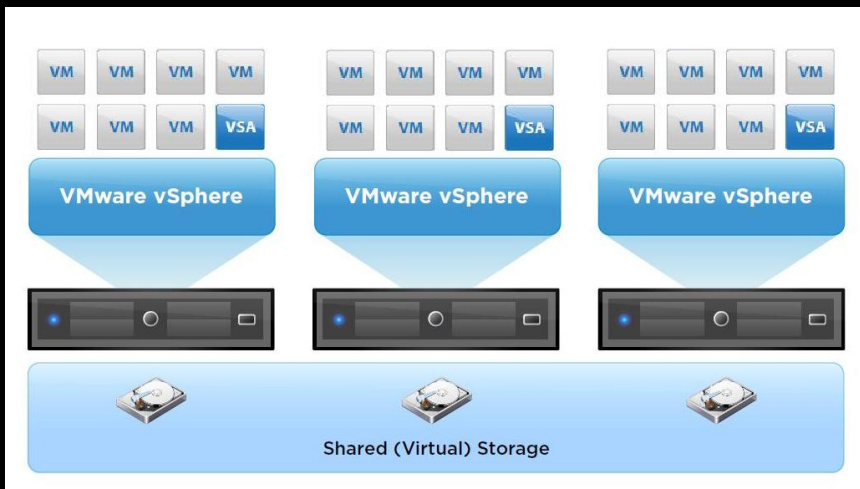
# 虛擬化儲存面面觀



# 虛擬化儲存組成方式-軟體式

## Example : 軟體式

### VMware vSphere Storage Appliance (VSA)



節省成本

## 優點

- 1 功能延展性高
  - 軟體開發功能無限可能，且不受異質儲存系統硬體限制
  - 不易服務中斷
- 2 擁有高可用性
  - 不再需要因保養設備而進行計畫性停機
- 3 硬體相容度高
  - 儲存系統廠牌幾乎無限制

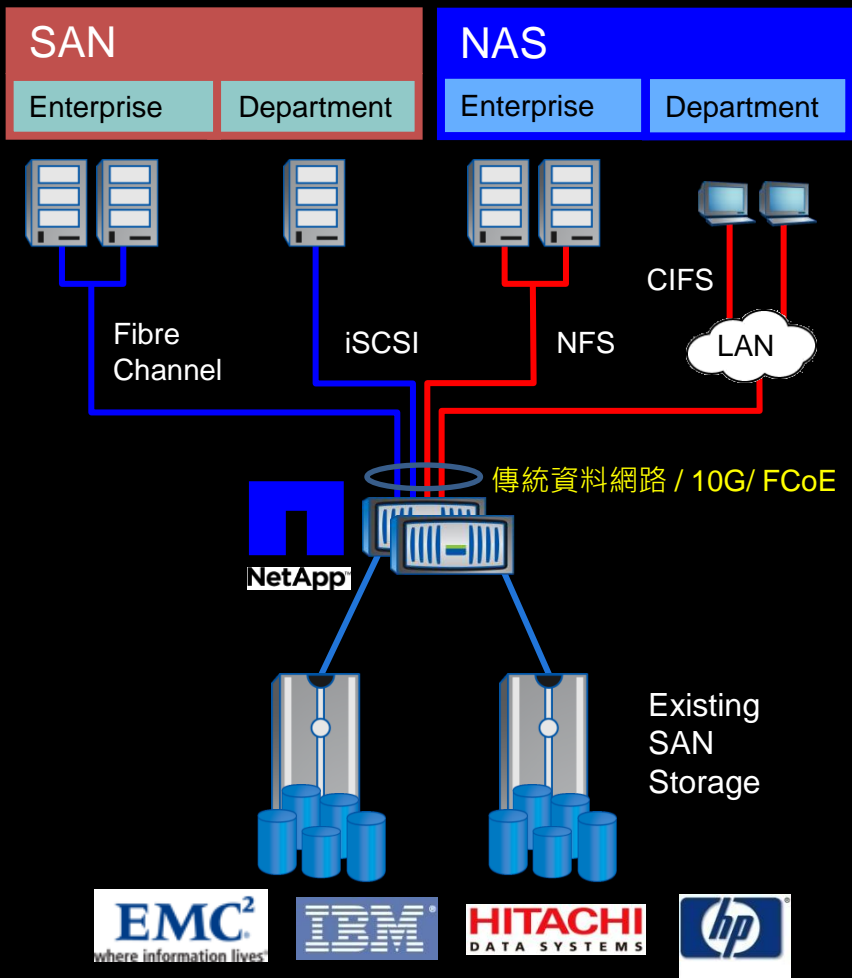
## 缺點

- 1 儲存系統優異功能無法發揮
- 2 伺服器及儲存系統效能降低
- 3 統合各廠儲存，穩定度下降、管理較複雜



# 虛擬化儲存組成方式-硬體式-多合一

## Example : 硬體式



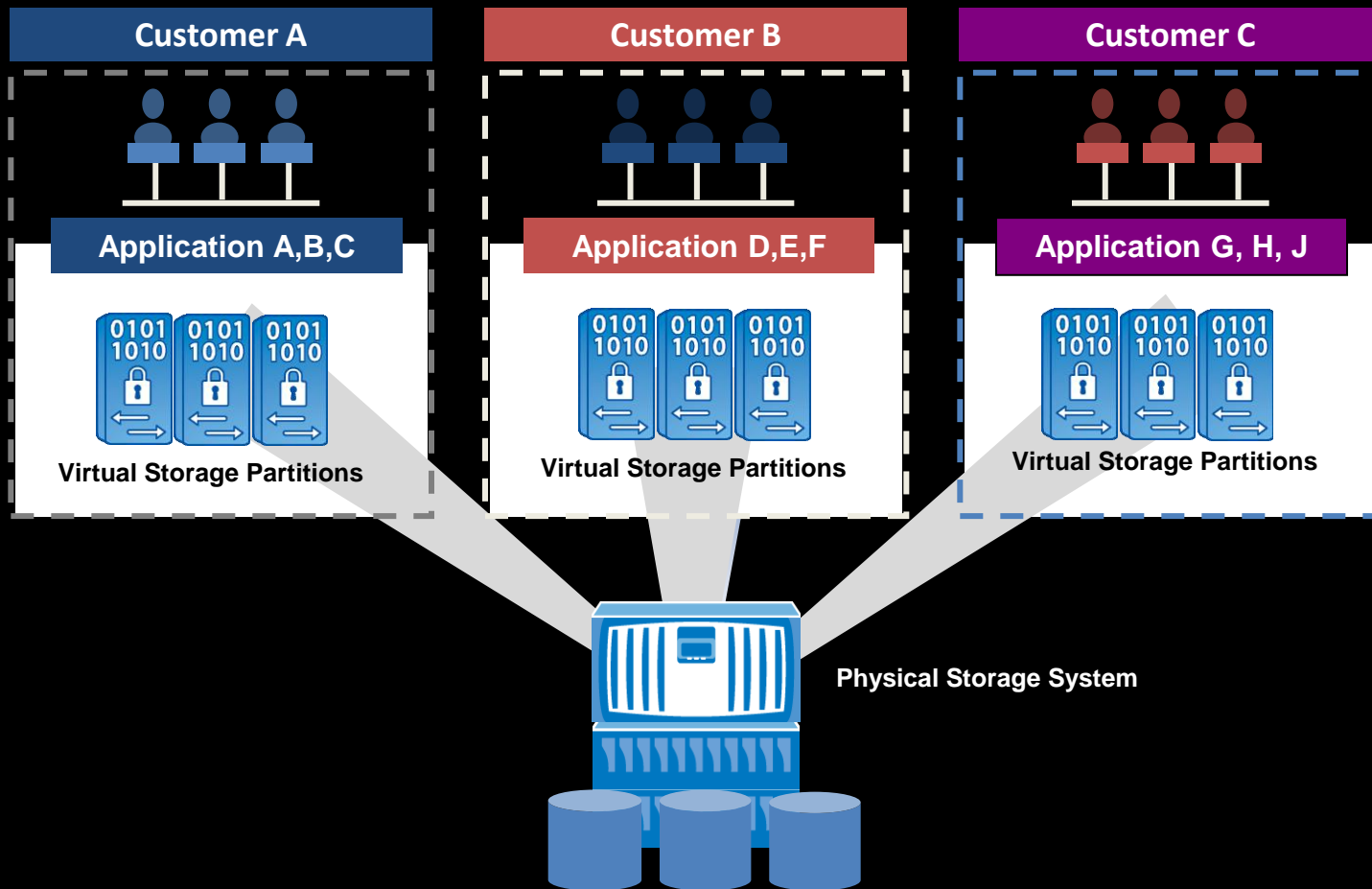
## 優點

- 1 儲存系統特性得以完全展現
  - 儲存系統特性得以完全展現，各家自有千秋
- 2 效能優異
  - 伺服器無須負擔儲存工作
  - 儲存系統效能佳
- 3 硬體相容度高
  - 有授權認證的儲存系統廠牌或型號才能整合，穩定性較高

## 缺點

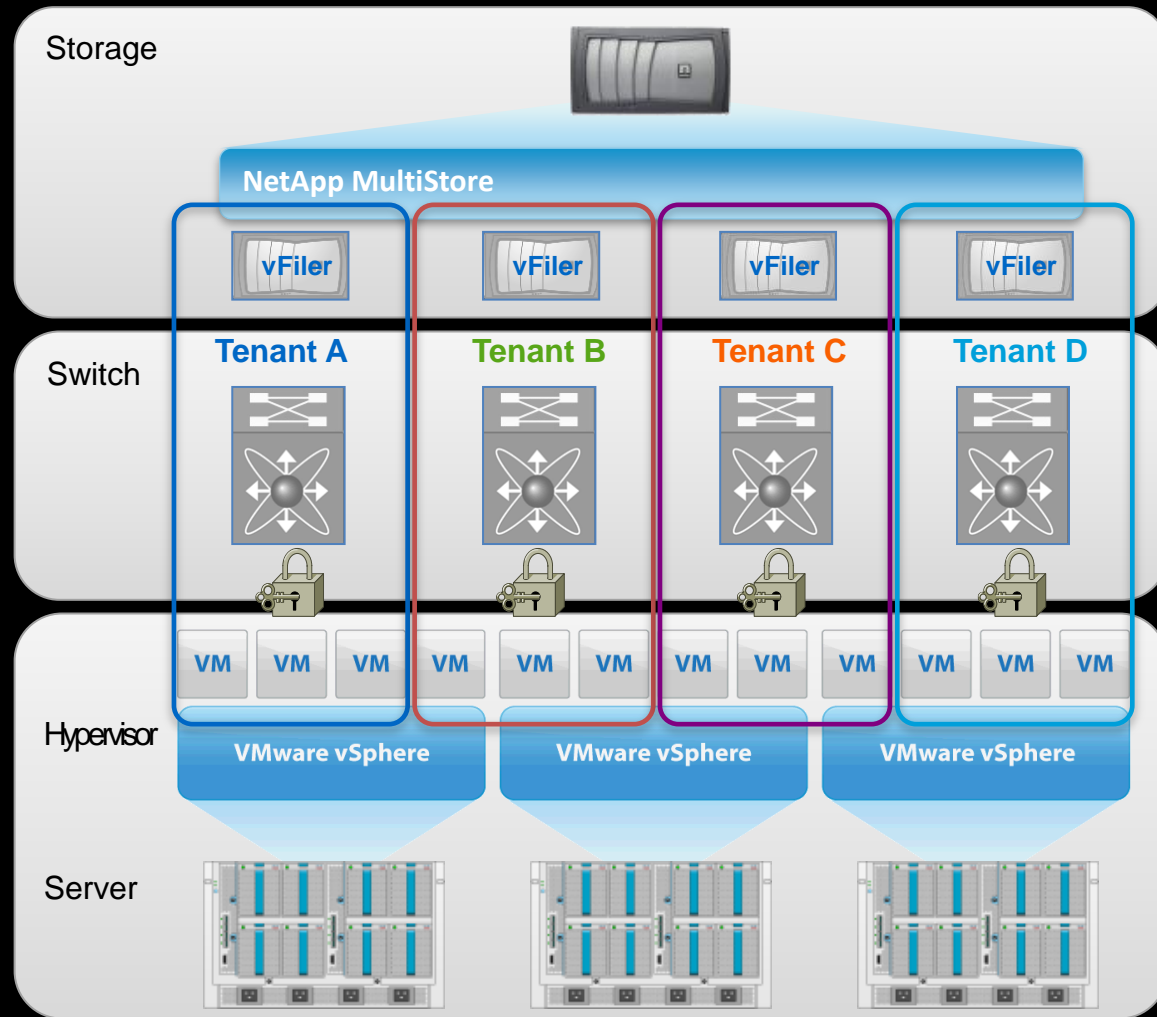
- 1 儲存系統較易被廠商綁定，更換不易
- 2 功能受儲存系統先天限制，不易擴展
- 3 成本較高

# 虛擬化儲存組成方式-硬體式-一變多



多重租賃架構

# 虛擬化儲存組成方式-硬體式-一變多



# VIRTUAL DATA CENTER

# 虛擬化儲存功能面



## RAID保護

避免雙磁片故障，  
並且性能損失極少。



## 自動精簡配置

### Thin Provision

創建看起來有一定大小的靈活卷，  
但實際是小很多的池。



## 重複資料刪除

### De-Duplication

會刪除主存儲和二級存儲中的  
資料冗餘。



## 快速複製虛擬副本

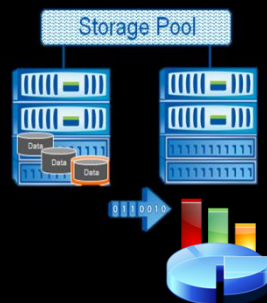
### Virtual Clone

接近零空間，即時“虛擬”副本。  
僅存儲Clone資料集中的後續更改。



## 儲存資源服務等級控制SLA

監控資源服務品質(如：CPU、  
Disk Pool、SAN/NAS資料流)，  
配合權重依照前端AP服務等級，  
自動調整資源分配率。

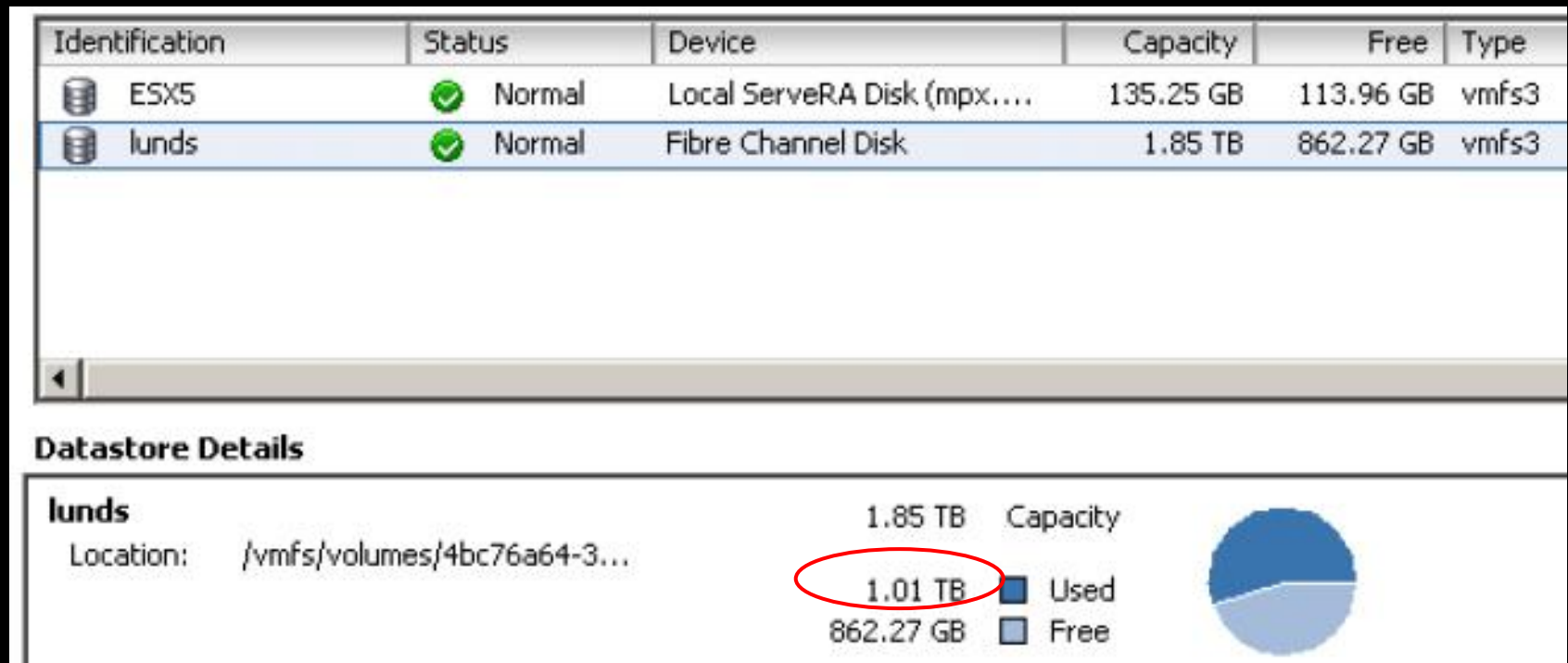


## 硬碟效能負載平衡

SSD,SAS,SATA依效能需求自  
動轉換。  
不停機資料移轉(Data Online  
Motion)至其他儲存系統。

# 傳統儲存佈署80個10GB的VMs

## FCP VMFS Datastore (1.9TB) : 1.01TB Storage Used





# 先進儲存佈署80個VM帶來的效益

## NFS Datastore (1.9TB) : 11.26GB Storage Used

Identification	Status	Device	Capacity	Free	Type
fasds	✓ Normal	192.168.2.10:/vol/fasds	1.95 TB	1.94 TB	NFS
ESXS	✓ Normal	Local ServerA Disk (mpx....	135.25 GB	113.96 GB	vmfs3
lunds	✓ Normal	Fibre Channel Disk	1.85 TB	1.84 TB	vmfs3

Datastore Details	
<b>fasds</b>	1.95 TB Capacity
Server: 192.168.2.10	11.26 GB Used
Folder: /vol/fasds	1.94 TB Free

# 快速複製虛擬主機實例

Step	Name	Status	Start Time	End Time
1.1	Create Virtual Machine	100%	6/4/2010 2:44:10 PM	6/4/2010 2:44:11 PM
1.2	Deploy file (using LAN)	100%	6/4/2010 2:44:12 PM	6/4/2010 2:44:12 PM
1.3	Change properties of virtual machine	100%	6/4/2010 2:44:12 PM	6/4/2010 2:44:15 PM

Virtual Machine Manager - vm-preston-scom.sea-tm.netapp.com

File View Go Actions Help

Jobs (305)

Name	Status	Start Time	Result Name	Owner
Create virtual machine	49 %	6/4/2010 2:44:10 PM	aw-vm-0	SEA-TM\ADMINISTR...
Refresh host	Completed	6/4/2010 2:38:46 PM	sea-preston01.sea-tm...	NT AUTHORITY\SYSTEM
Remove virtual machine	Completed	6/4/2010 2:28:38 PM	aw-vm-0	SEA-TM\ADMINISTRATO
Refresh virtual machine	Completed	6/4/2010 2:25:00 PM	aw-vm-0	NT AUTHORITY\SYSTEM
Create virtual machine	Completed	6/4/2010 2:13:56 PM	aw-vm-0	SEA-TM\ADMINISTRATO

Step	Name	Status	Start Time	End Time
1	Create virtual machine	49 %	6/4/2010 2:44:10 PM	
1.1	Create virtual machine	100 %	6/4/2010 2:44:10 PM	6/4/2010 2:44:11 PM
1.2	Deploy file (using LAN)	100 %	6/4/2010 2:44:12 PM	6/4/2010 2:44:12 PM
1.3	Change properties of vi...	100 %	6/4/2010 2:44:12 PM	6/4/2010 2:44:15 PM
1.4	Fix up differencing disks	0 %		
1.5	Install VM components	0 %		

VM files already deployed by New-Clone cmdlet



# 備份/備援 解決方案

2011/9/12

# 停機的原因

- 操作管理不當
    - 人員與流程、設定與問題處理
  - 應用程式錯誤
    - Bugs、效能問題、變動管理流程
  - 系統零件故障
    - 介面卡、硬碟、控制器、迴路
  - 資料中心停擺
    - 火災、大樓水電問題、駭客攻擊、恐怖份子
  - 地區性的災難
    - 發電廠故障、颱風、地震、海嘯、洪水
- 
- | Category                     | Percentage |
|------------------------------|------------|
| 操作管理不當 (人員與流程、設定與問題處理)       | 80%        |
| 應用程式錯誤 (Bugs、效能問題、變動管理流程)    |            |
| 系統零件故障 (介面卡、硬碟、控制器、迴路)       | 10%        |
| 資料中心停擺 (火災、大樓水電問題、駭客攻擊、恐怖份子) | 10%        |
| 地區性的災難 (發電廠故障、颱風、地震、海嘯、洪水)   |            |

# 備份最佳化功能



## Snapshot™ 副本

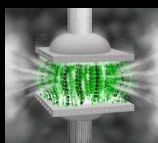
僅寫入更改塊的時間點副本。  
最少的性能損失。



## 重複資料刪除

### De-Duplication

縮減資料傳輸量。  
縮短資料傳輸時間。  
降低頻寬租賃成本。



## 資料壓縮功能

### Compress

縮減資料傳輸量。  
縮短資料傳輸時間。  
降低頻寬租賃成本。



## 資料流控制QoS

監控傳輸品質，配合Policy自動變更備份頻寬需求。



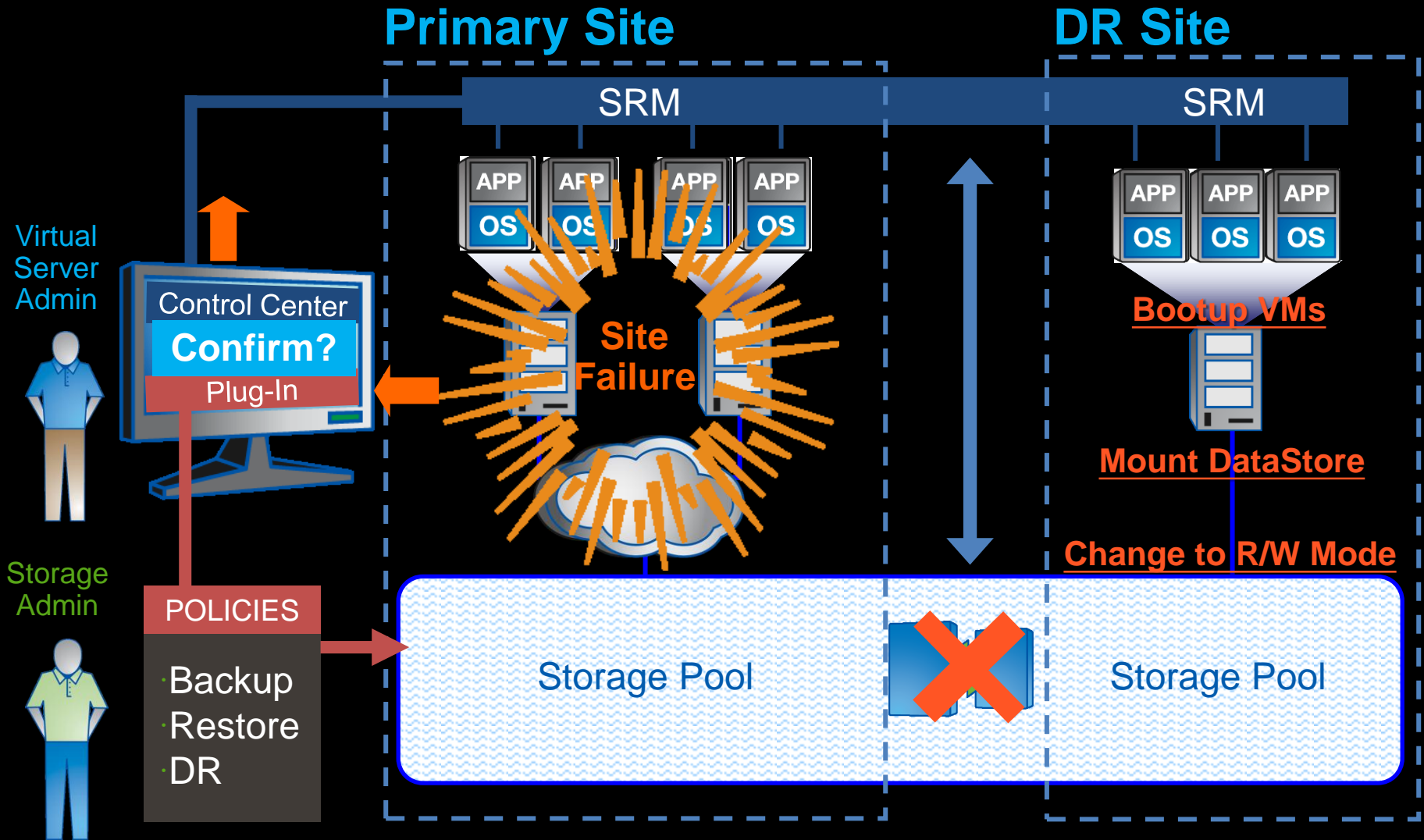
## 可即時調閱的精簡DR備份

### DR Backup (Not Archiving)

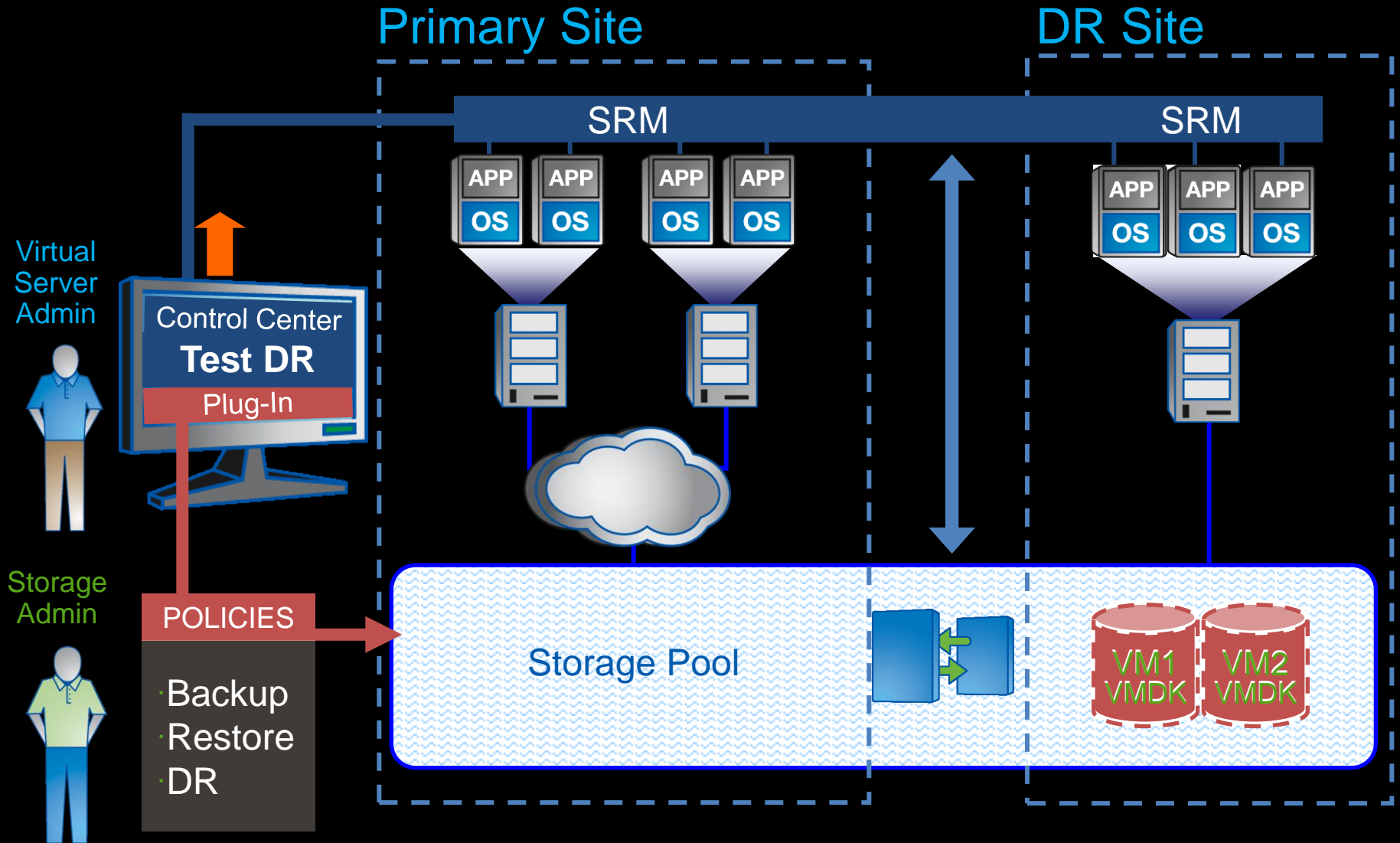
整合重複資料刪除及壓縮技術，讓DR端儲存系統使用最少空間量，為災難恢復和備份製作資料副本。



# 自動化備援解決方案



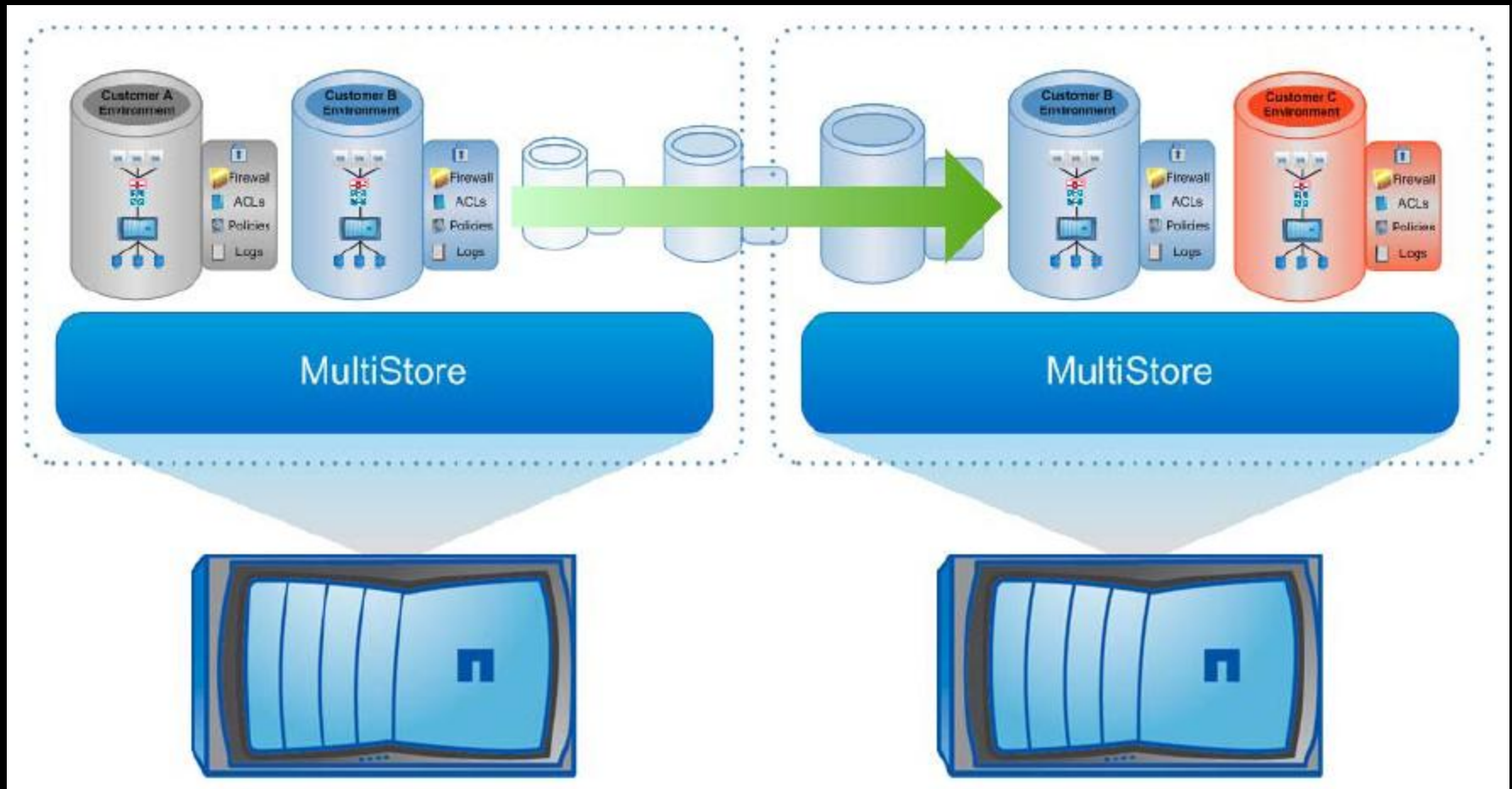
# 自動化DR流程演練與測試



# 虛擬資料中心異地備援

Primary Site

DR Site



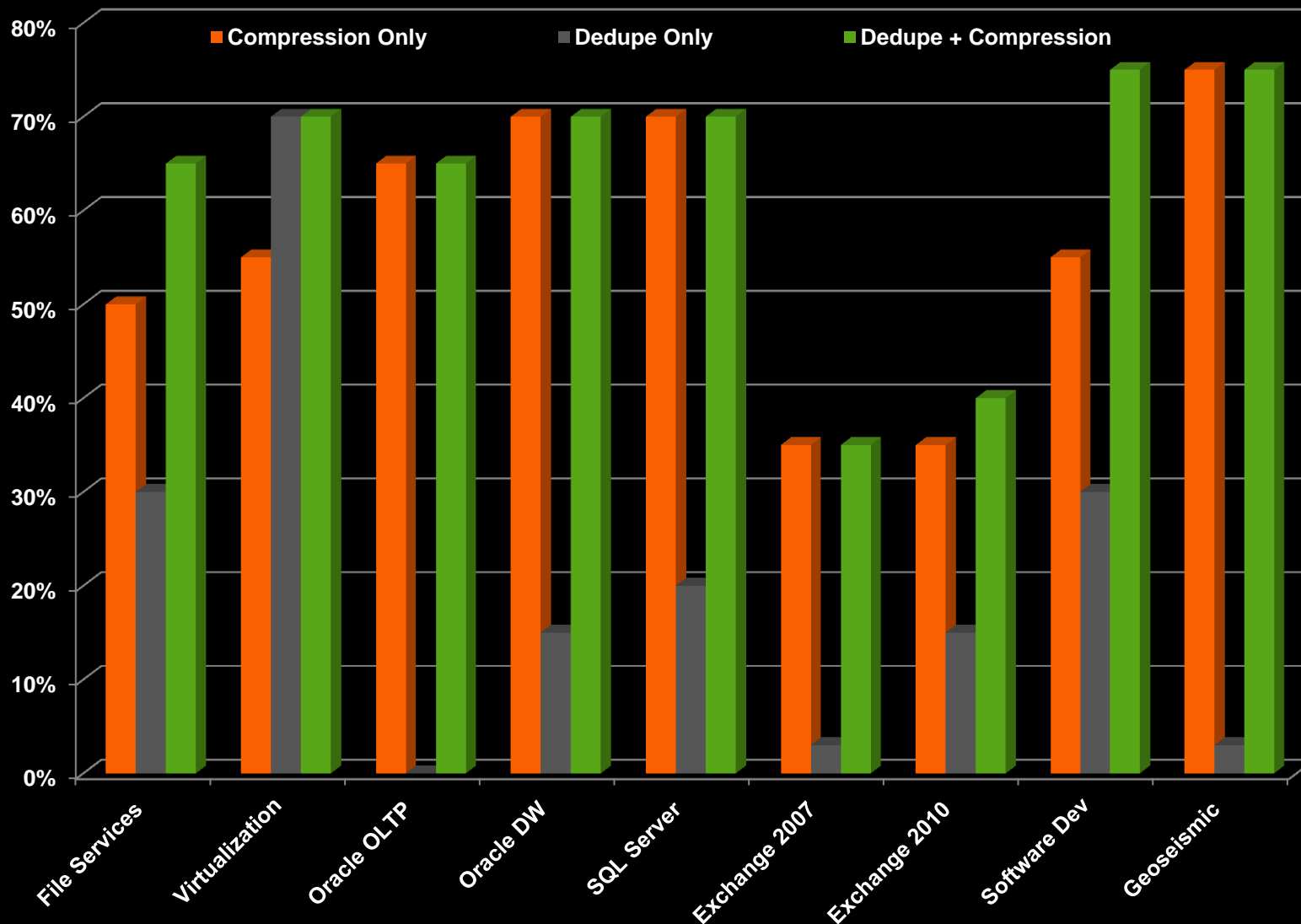


# 參考附件

2011/9/13

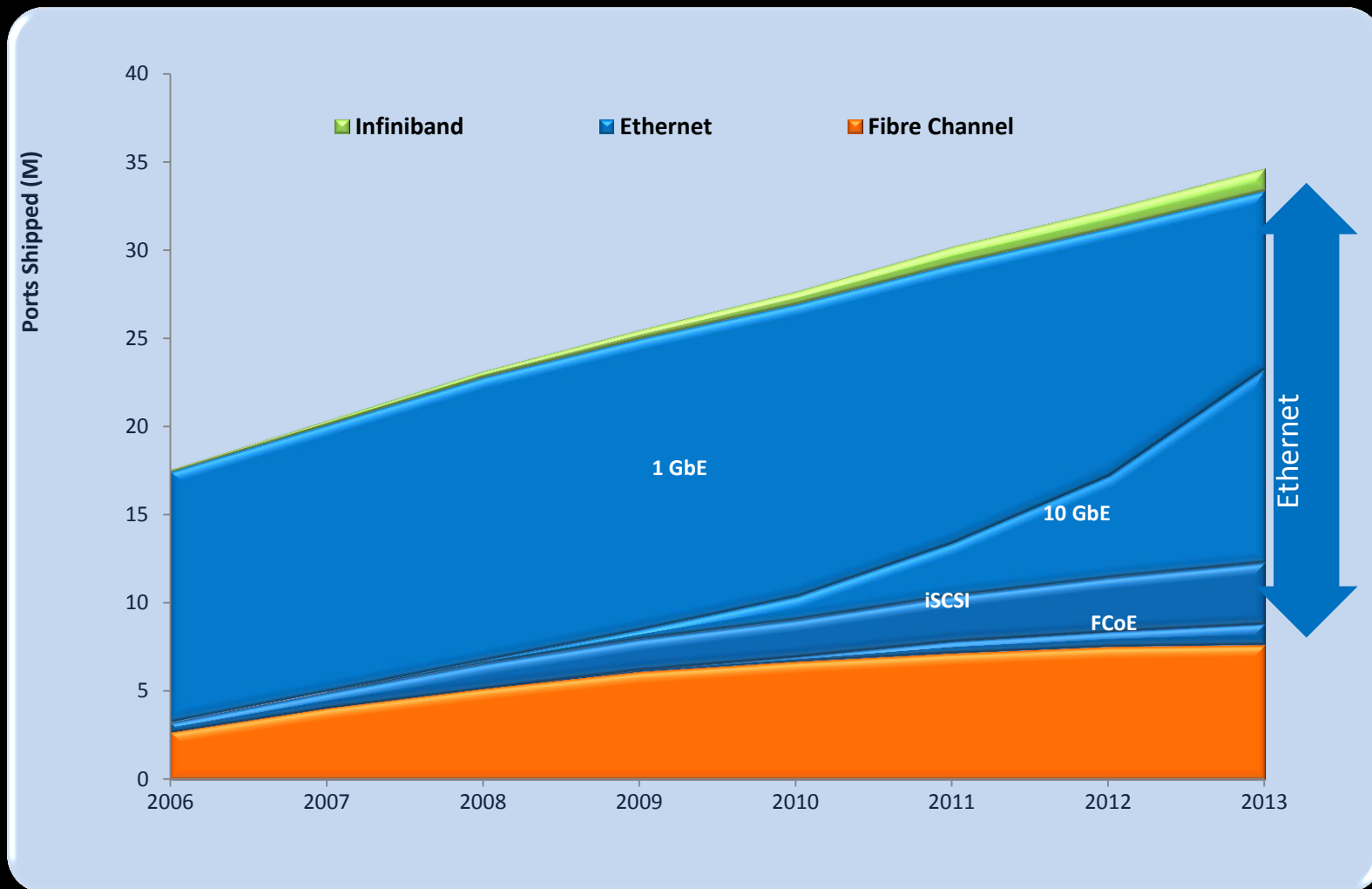


# 儲存空間節省範例





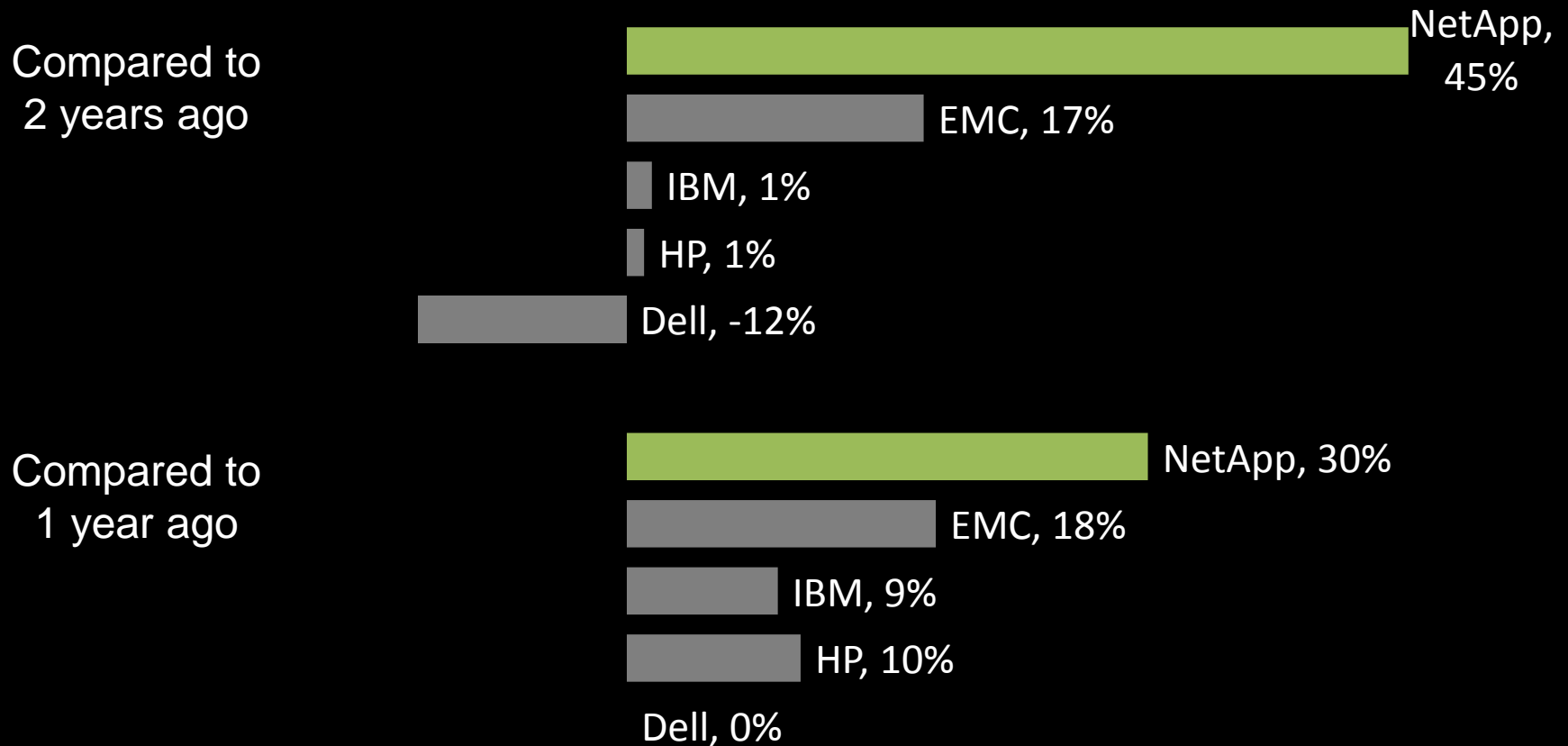
# 儲存市場趨勢



Source: IDC – Intel FCoE Assessment, Rick Villars, Dell ‘Oro Network Adapter Forecast Tables Jul 09, IDC Infiniband Volumes 2008, Intel market model estimates

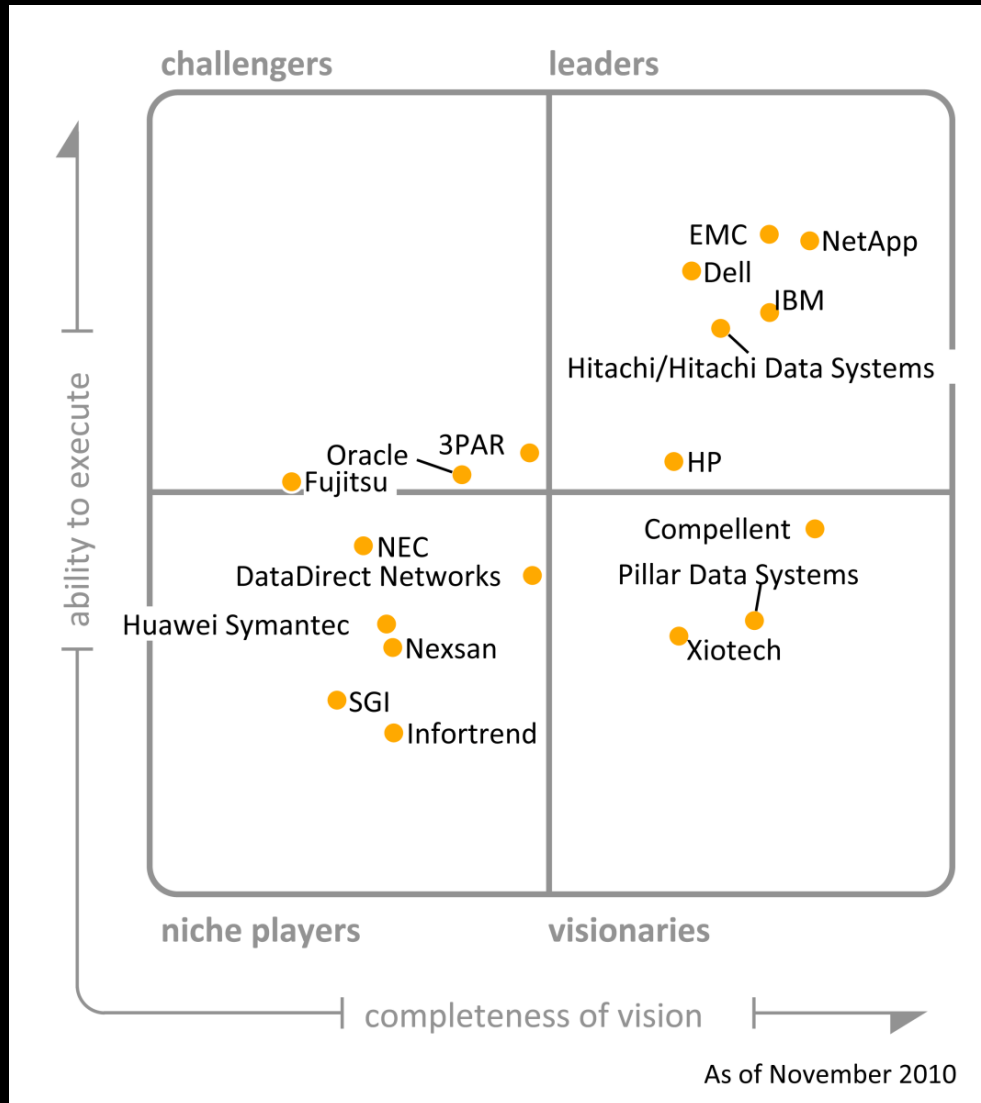
# 儲存市場中成長最快

## Most Recent 4 Quarters Revenue Growth



# 儲存市場競爭力 -- Leaders

## Gartner Midrange & High End Modular Disk Array Magic Quadrant



Source: Gartner, Inc. Nov 2010  
Roger W. Cox, Jimmie Chang, Pushan Rinnen, Stanley Zaffos

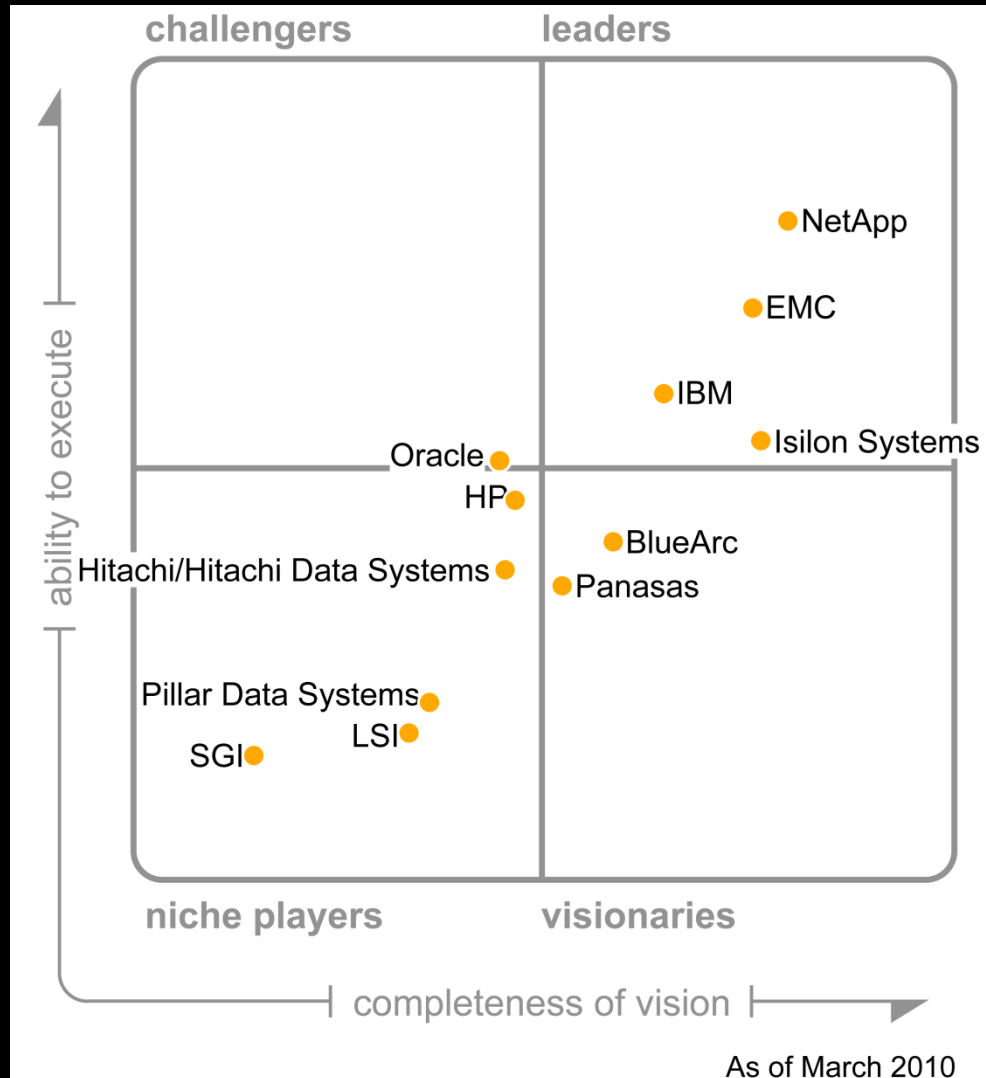
### Magic Quadrant for Midrange and High-End Modular Disk Arrays

This Magic Quadrant was published as part of a larger research note and should be evaluated in the context of the entire report.

The Magic Quadrant is copyrighted Nov 15, 2010 by Gartner, Inc. and is reused with permission. The Magic Quadrant is a graphical representation of a marketplace at and for a specific time period. It depicts Gartner's analysis of how certain vendors measure against criteria for that marketplace, as defined by Gartner. Gartner does not endorse any vendor, product or service depicted in the Magic Quadrant, and does not advise technology users to select only those vendors placed in the "Leaders" quadrant. The Magic Quadrant is intended solely as a research tool, and is not meant to be a specific guide to action. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

# 儲存市場競爭力 – Leaders

## Gartner Magic Quadrant : Midrange and High-End NAS Solutions



Source: Gartner, Inc. March 2010  
Pushan Rinnen, Robert E. Passmore,  
Roger W. Cox

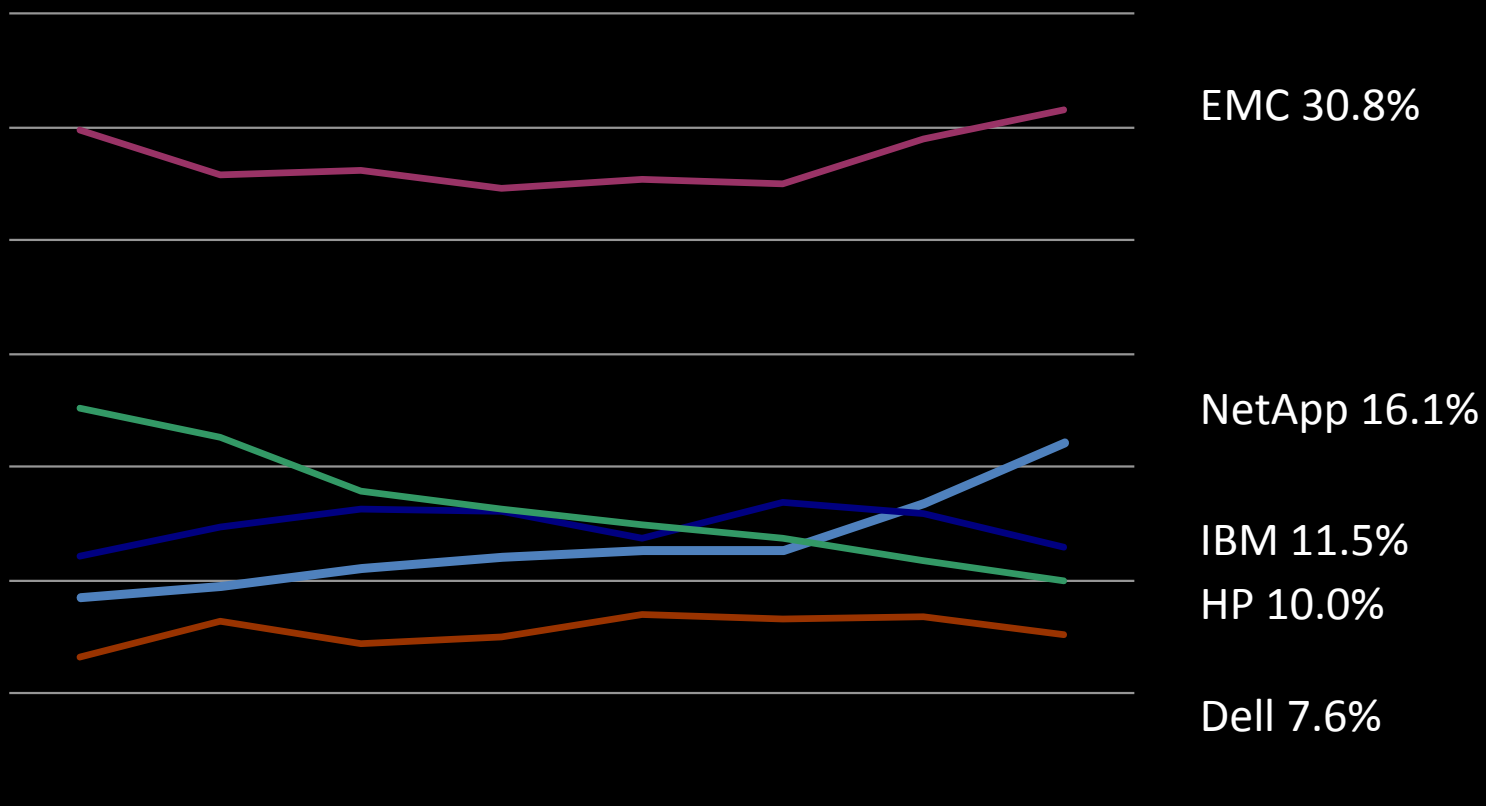
### *Magic Quadrant for Midrange and High-End NAS Solutions*

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# 儲存設備市占率

## Market Share Trend – Revenue



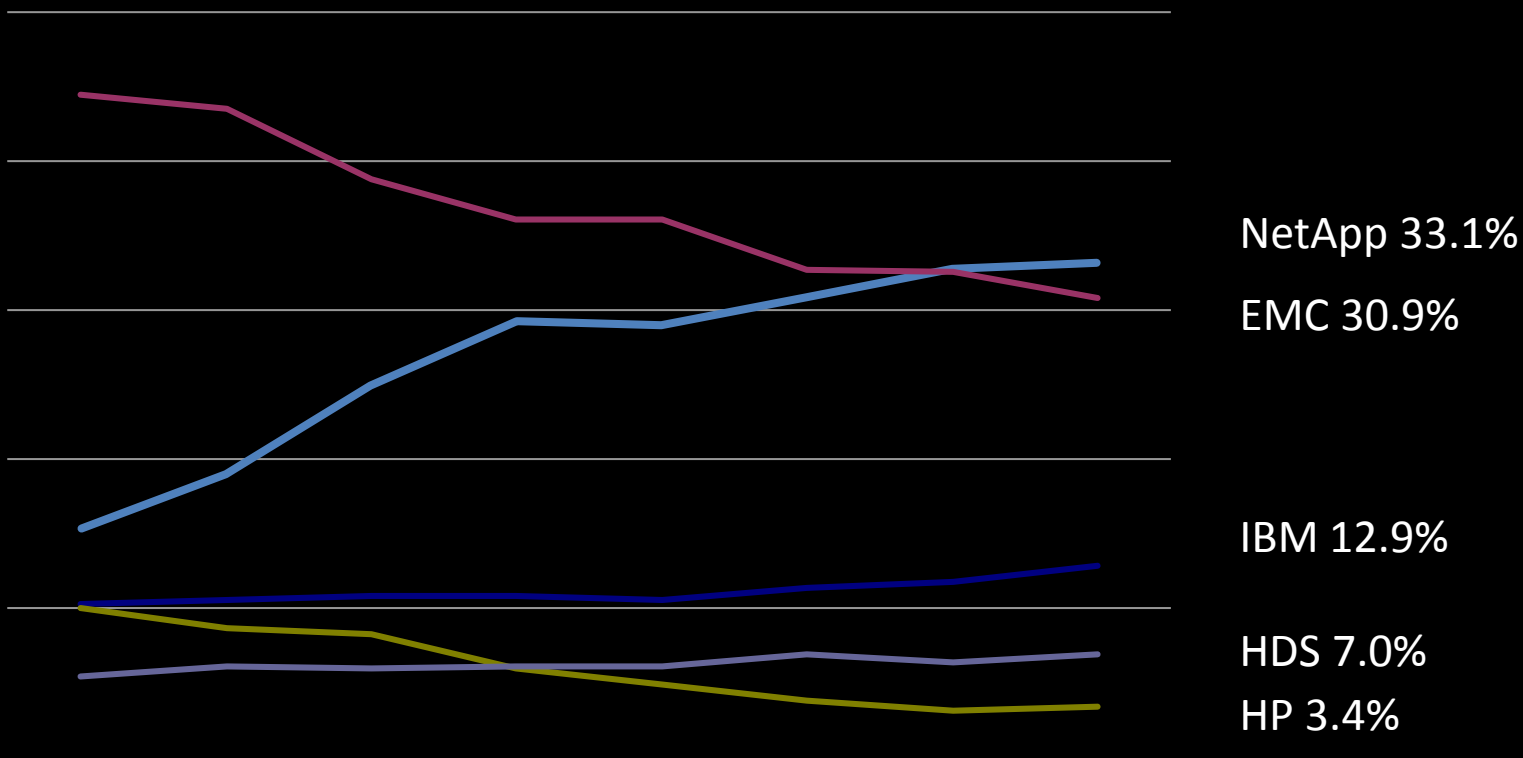
Source: IDC, June 2011

Combined NAS and SAN markets



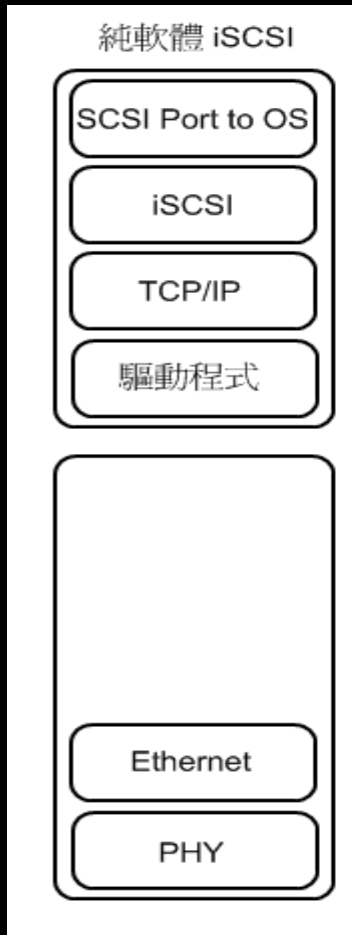
# 儲存複製軟體市占率趨勢

## Storage Replication Software Market Share Trend



Source: IDC, June 2011

# TOE 網卡到底改善了甚麼？



- 在Windows2008查看TOE是否打開命令  
`netsh int tcp show global`
- 在Windows2008設置TOE打開或者關閉  
`netsh int tcp set global chimney=enabled/disabled`
- 在Windows XP 64bit和server 2003中設置TOE是否打開  
`netsh int ip setchimney enable/disabled`
- Other Playform  
Please, Check Tech. DOC

iSCSI Multi-Connection讓iSCSI頻寬提升，可提供更好的服務品質

# Q & A

