

# 3Gen unified storage solutions

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## 資料儲存解決方案

儲存容量提供/資料安全保護

**樂高電腦股份有限公司**

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# 3Gen Data System OverView

- 3Gen Data System的技術開發是由一個全球開發團隊組成的。其總部位於美國密西根州，並且在日本，韓國，大陸均設有辦公室。其系統設計和測試工程師位在美國，而軟件開發則委由美國,印度負責，硬件組件開發部門位於全世界OEM 重鎮:台灣。以其全球性網絡獲得最優質的資源，讓 3Gen為客戶提供最可靠的存儲技術解決方案。
- 作為行業領導者，3Gen有能力並且積極推動儲存市場標準的架構。3Gen標準的儲存解決方案不僅會增加企業的成本效益，而且也使企業基於此標準來獲得不斷的進步。
- 3Gen Data System之前均跟各大廠商如IBM、HP 等提供OEM 服務。其IntelliNAS 設備目前為止已經超過24 個國家至少1700 個客戶使用我們的系統，超過3000 台機器已經安裝完成提供企業服務。
- 富士通、三星、韓國的國民銀行、Motorola、Scientific Atlanta、Comcast、SONY 等等均是重要的客戶之一

- Privately funded and founded in March 2006. Total Employees:58
- Executive Team from EMC, IBM, 3Com, Legato and Iomega
  - Thomas Lok, CEO
    - **Greater China-LEGO Technology Corporation**
      - Albert Shan (Director, Operation) ,Sun(Engineering)
      - Jimmy Lan (Director, Sales)
    - USA-Sabrina Lok (Director, Engineering),Europe-Ulrike Tegtmeier (Country Manager),Korea-Ken Lee (Country Manager) ,Japan-Mikio Tsujioka (Country Manager)

# 3Gen Data System World Overview



## Who We Are

- Major Investors:
  - **Blackstone Investment Group**
  - **KingTech Corporation, Japan (CEO - 王遠耀)**
    - **Digital China – Investor**
  - **Tom Lok**
- Executive Team from EMC, IBM, 3Com, Legato and Iomega
  - USA
    - **Tom Lok**
  - Europe
    - **Ulrike Tegtmeier**
  - Korea
    - **Ken Lee (Country Manager)**
  - Japan
    - **Mikio Tsujioka (Country Manager)**
  - Greater China
    - **Albert Shan (Director, Operation)**
    - **Jimmy Lan (Director, Sales)**
- Total Employees:
  - 58

# Customer Profile

- 1700+ customer sites worldwide and 3,000+ installations
- Customers in 24 countries
  - FUJITSU, Scientific Atlanta, Washington Mutual Bank, Sumitomo Mitsui Bank.
  - OEM – Samsung and AIC
- Over 150 resellers worldwide
- 5 Branch Offices:
  - USA/Korea/Japan/Taiwan/Germany



Scientific  
Atlanta  
A CISCO COMPANY



FUJITSU



효성인포메이션시스템(주)

HITACHI  
DATA SYSTEMS



# 3Gen Storage 功能架構說明

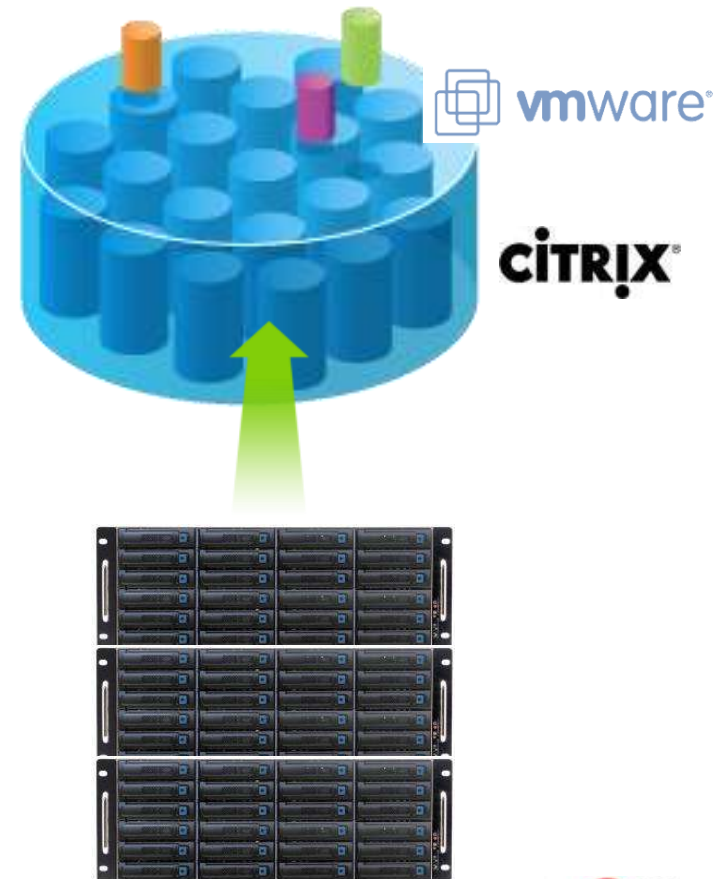
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# 符合使用於 Cloud、virtualization環境的儲存設備

- Unified Storage
- Modular
- Availability
- Security
- Scalability
- Performance
- Software on Storage

雲端、虛擬化儲存需求:  
Storage HA  
Thin-Provisioning  
Data Du-duplication

Virtualized Pool of Storage



# 3Gen Unified Storage：全方位儲存解決方案

## 雲端、虛擬化的資訊架構

- 可根據虛擬主機的增加而擴充
- 只需要購買現在所需要的容量
- 完全不需要預留資料容量
- 大量節省資料儲存容量

- Scale-out Storage (HA active/active)
- On-line Volume expansion
- Dynamic Thin-Provisioning
- Block level Data De-duplication

## 高可用性與容錯機制

- 靈活決定LUN的資料保護等級
- 實施多點資料保護,消除單點失效
- 虛擬伺服解決方案

- Network Storage RAID (Gateway)
- HA(active/active),256 nodes
- Virtualized Server solution

## 災難恢復,異地備援

- 資料快照、複製,恢復先前的資料
- 異地備援機制建立

- Volume Snapshot , Volume Clone
- Remote Data Mirroring,Replication

**3Gen Storage Solution**



# 3Gen Unified Storage 八大重點產品功能

1

## Unified Storage

- 整合型儲存設備
- Support NAS, iSCSI, SAN
- Storage Gateway-可整合他牌儲存設備

2

## HA Solution

- 可擴展效能及容量
- 建立設備容錯備援機制
- Clustering + Data Mirroring
- HA (active to active)
- Scale-out to 256 Nodes

3

## Snapshot , Clone

- 資料保護, 資料複製
- Volume Snapshot
- Volume Clone
- unlimited

4

## Thin Provisioning

- 降低成本, 增加容量使用率
- 有使用才給容量
- Dynamic Thin Provisioning



**3Gen**  
Data Systems

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## Remote- Replication

- File level Data-Replication
- Remote Block level Synchronous and Asynchronous Mirroring

6

## Data De-duplication

- 節省儲存容量, 降低成本
- 可省35%~70%容量
- Block level De-duplication
- 縮短資料備份時間
- 減輕網路頻寬負擔

7

## Virtualized Server

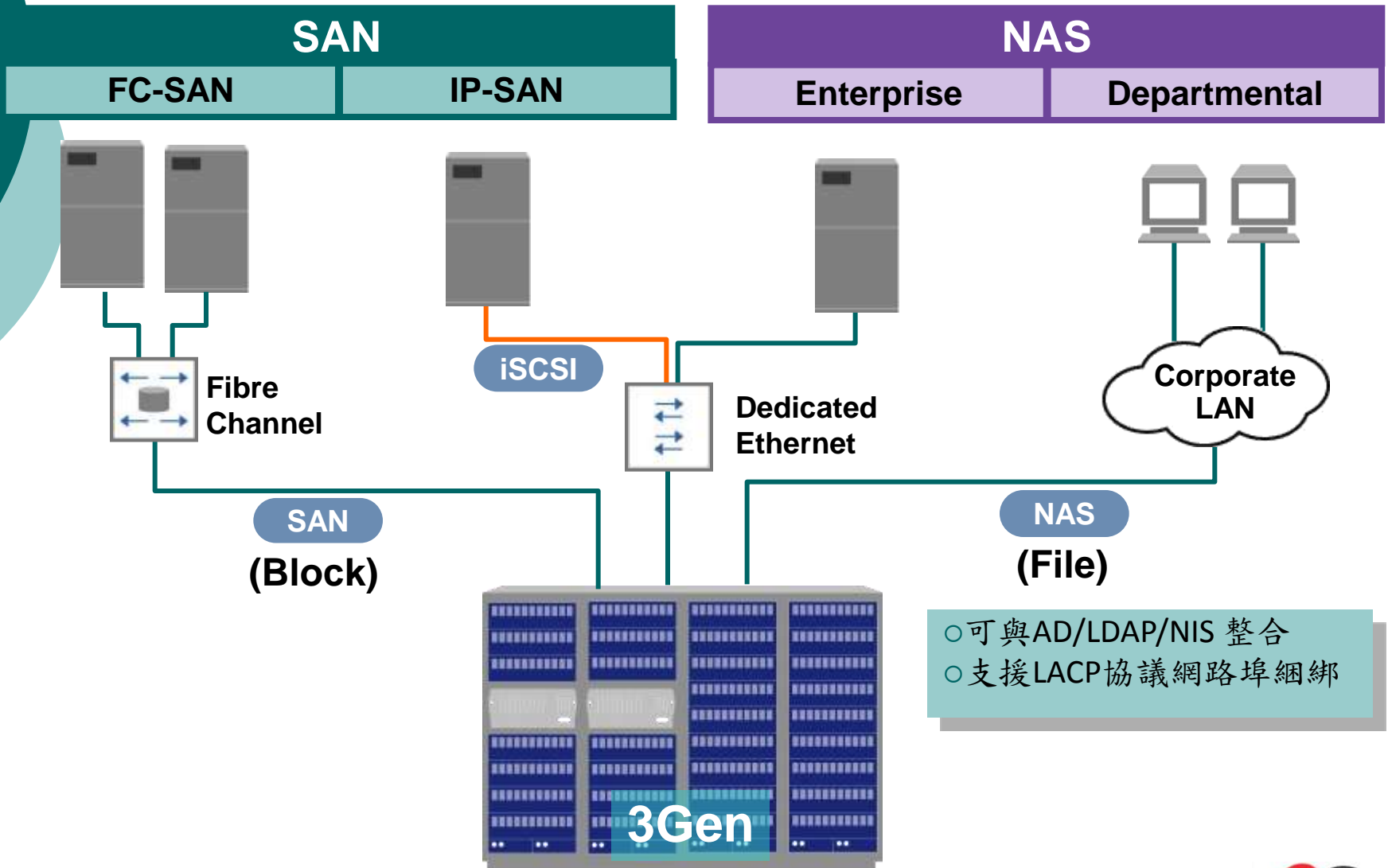
- 虛擬伺服器解決方案
- 可直接安裝AP軟體, 二合一

8

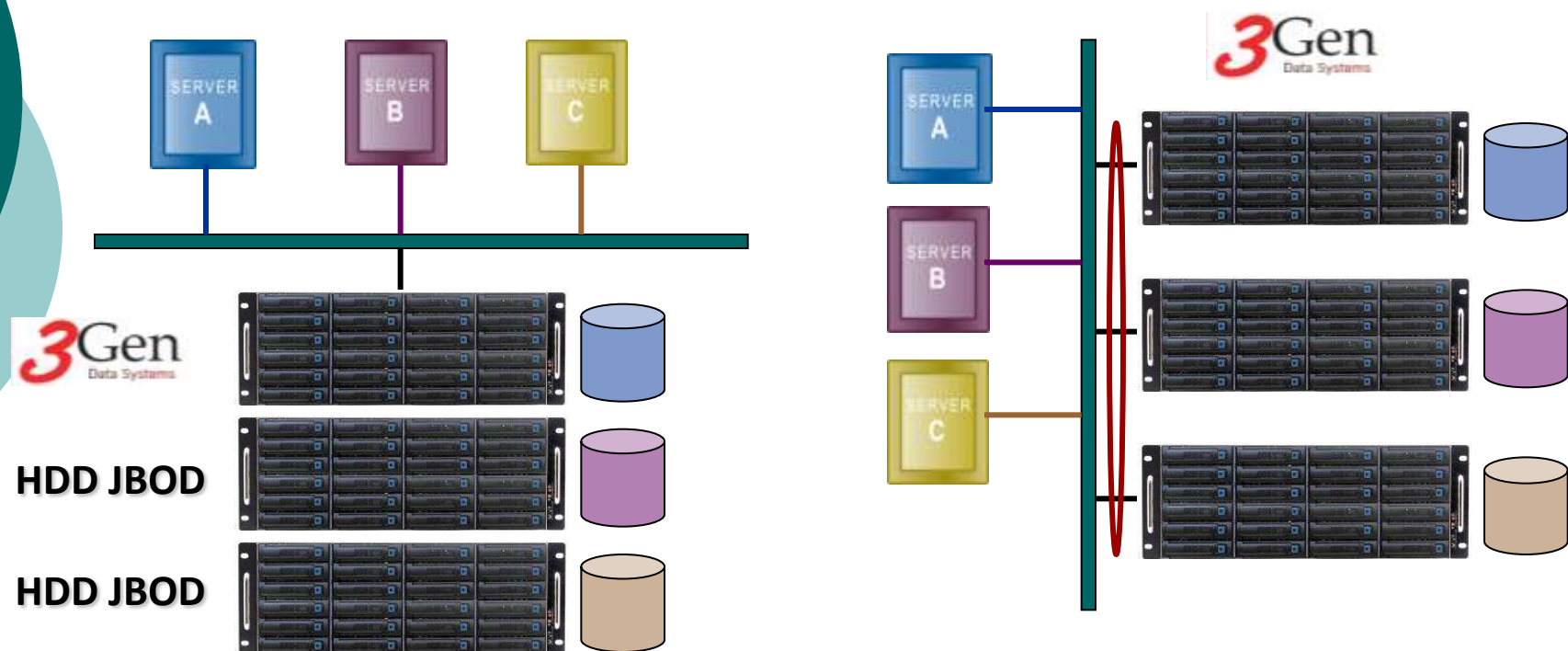
## SSD Caching

- 可突破硬碟效能瓶頸
- 數據寫入無停電疑慮
- High Performance
- Eliminated data Loss

# 3Gen Unified Storage :Support NAS / iSCSI / FC-SAN



# 能隨需求擴充容量:支援Scale-up 和Scale-out



## ○Scale-up(垂直擴充)

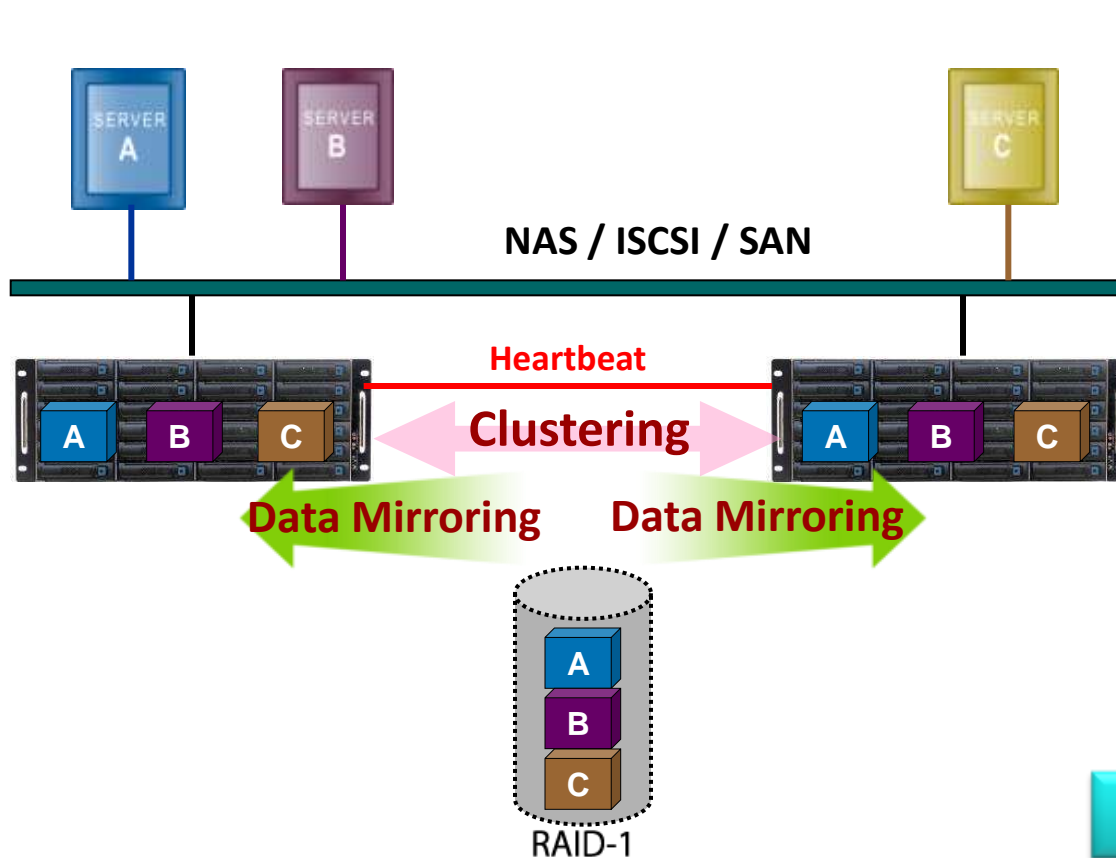
- 單一SAS Channel可擴充120顆HDD
- 容量擴充,建置成本低
- 適用於海量儲存,資料倉庫
- 可將資料複至另外一組設備

## ○Scale-out(水平擴充)

- 3Gen 可擴充至256台設備
- 確保資料存取頻寬速度
- Clustering多台設備為單一pool
- 可容許單點失誤(配Data Mirroring)
- Network RAID架構

Scale-out / up

# HA (Active-Active) Solution : Storage Clustering + Synchronous Data Mirroring



## HA Solution

- can up to 256Nodes

Support NPIV

HA Solution

- 儲存控制主機、叢集備援、系統運作不中斷。
- 多台儲存控制主機建立叢集(Clustering)機制。(自動接手服務)
- 儲存資料以資料鏡射功能(Data Mirroring)，建立多份資料備份。
- 具備多份儲存資料、無需另備份資料。
- automatically migrate volume to cluster mirroring,(升級HA機置,資料無需重建)

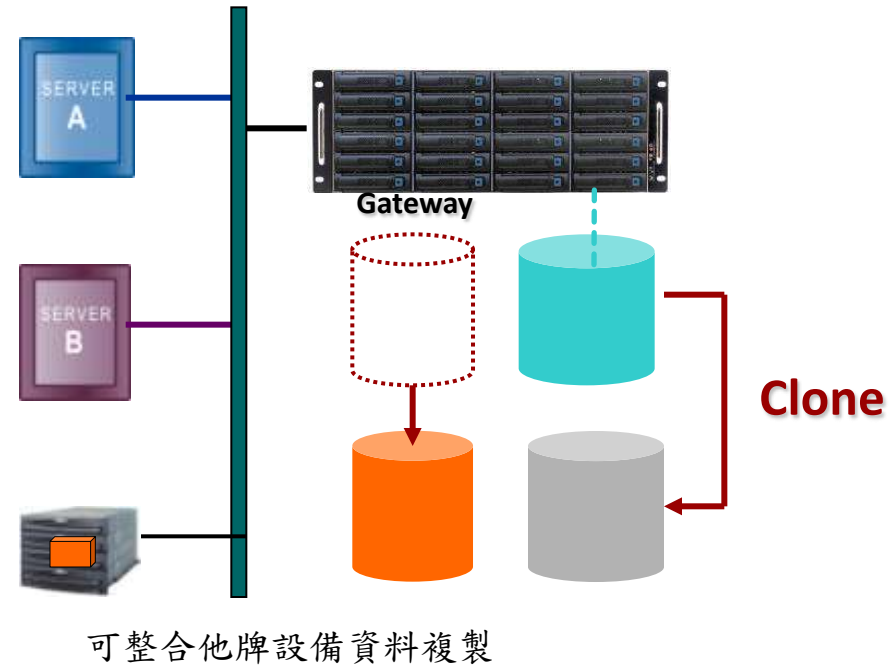
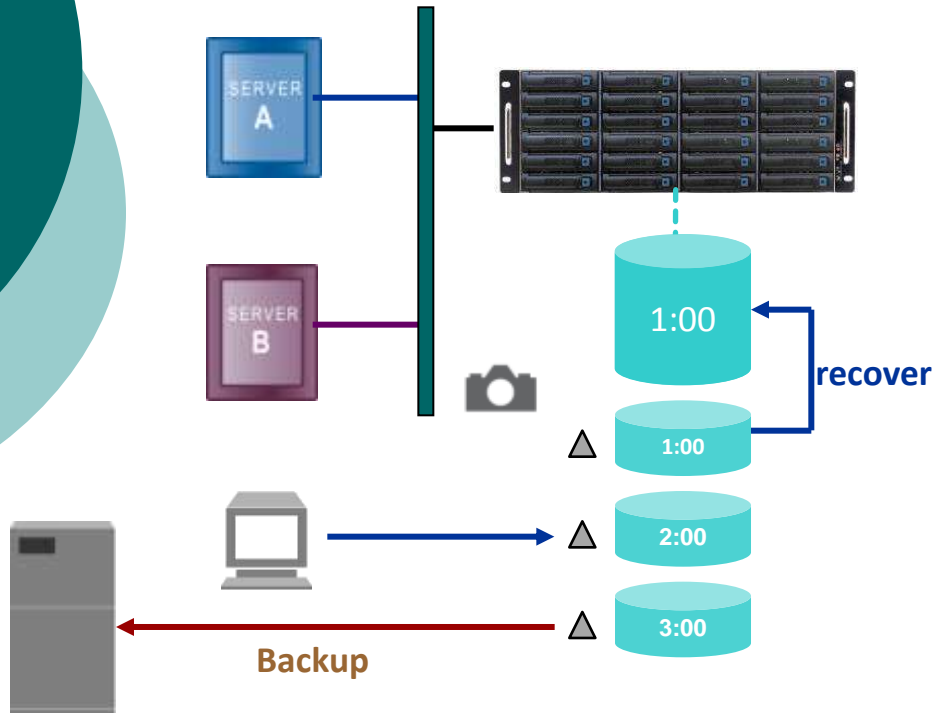
# Active-Active Clustering Comparison

	3Gen	NetApp	EMC	IBM	Dell
<b>Number of Clustering Members</b>	Up to 256 members	2	2	2	2
<b>Storage Interface</b>	NAS, FC and iSCSI	NAS, FC and iSCSI	FC and iSCSI	FC and iSCSI	FC and iSCSI
<b>Support Storage and Gateway concurrently</b>	✓	No	No	No	No
<b>Automated Workload Balancing</b>	✓	No	No	No	No
<b>One Unified Cloud Storage Architecture</b>	✓	No	No	No	No

# Active-Active Clustering features overview

- Number of Clustering Members
  - 3Gen's Unified Cloud Storage Architecture supports up to 256 cluster members. All other competitors support cluster member of 2 only
- Storage Interface
  - 3Gen and NetApp are the only two companies supports Active-Active Clustering with NAS and SAN storage
- Support Storage and Gateway concurrently
  - 3Gen architecture supports both storage and gateway simultaneously. No other competitors can support this feature
- Workload Balancing
  - Cluster IP will automatically distribute the workload to all cluster members to ensure maximum performance. All our competitors will require manual tuning in order to achieve optimal performance.
- One Cloud Storage Architecture
  - All 3Gen cloud storage features such as data de-duplication, thin provisioning, and remote data mirroring will be available for active-active clustering configuration.
  - Our competitors have chosen to buy technologies instead of growing their own. This has lead to incomparable technology and architecture. It will take them a long time to integrate all difference features that are based on difference architectures.

# 低成本的災難回復功能-Snapshot & Clone



- 簡單的備份及回復
- 時間點的資料複製
- 排程設定
- 功能
- 磁卷回復
- 回復至任一快照時點
- 備份功能整合

Snapshot

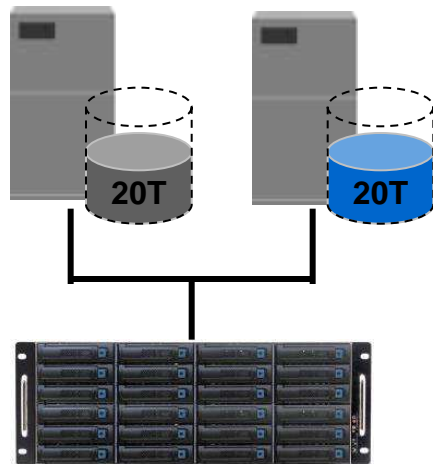
- Volume Clone
- 透過複製功能真正降低成本
- 系統映像(system images)的理想儲存方式
- 即時供應磁卷副本提供測試及開發使用
- 可以測試真實的資料
- 不會影響線上資料

Volume Clone

# 有效提供儲存使用率: Dynamic Thin Provisioning

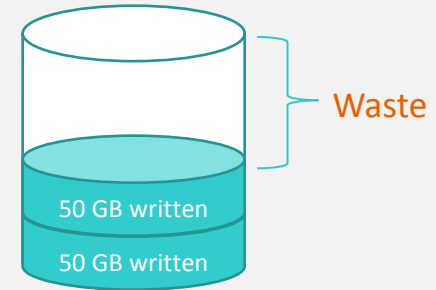
使前端的伺服器以為儲存設備安裝了比實際還多的儲存容量  
可提高實體之儲存空間之彈性與利用效率

- 節省成本  
只需購買目前的硬碟容量
- Dynamic技術  
不需要預留空間,有使用才給容量
- 簡化容量規劃
- 擴充容量無須停機



## Full Provisioned

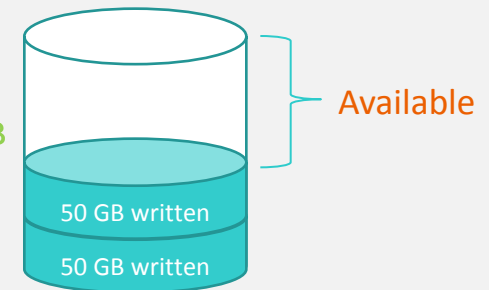
Allocated	200 GB
Available	0 GB
Used	50 GB
Wasted	150 GB



200 GB Volume

## Thin Provisioning

Allocated	50 GB
Available	150 GB
Used	50 GB
Wasted	0 GB



200 GB Volume

Thin-Provisioning



# Thin Provisioning Comparison

	3Gen	NetApp	EMC	IBM	Dell
Design	Dynamic	Dynamic	Static	Static	Static
Automated Space Reclaimed	✓	✓	No	No	No
Predictable Performance	✓	✓	No	No	No
Maximum Storage Utilization	✓	✓	No	No	No
One Unified Cloud Storage Architecture	✓	No	No	No	No

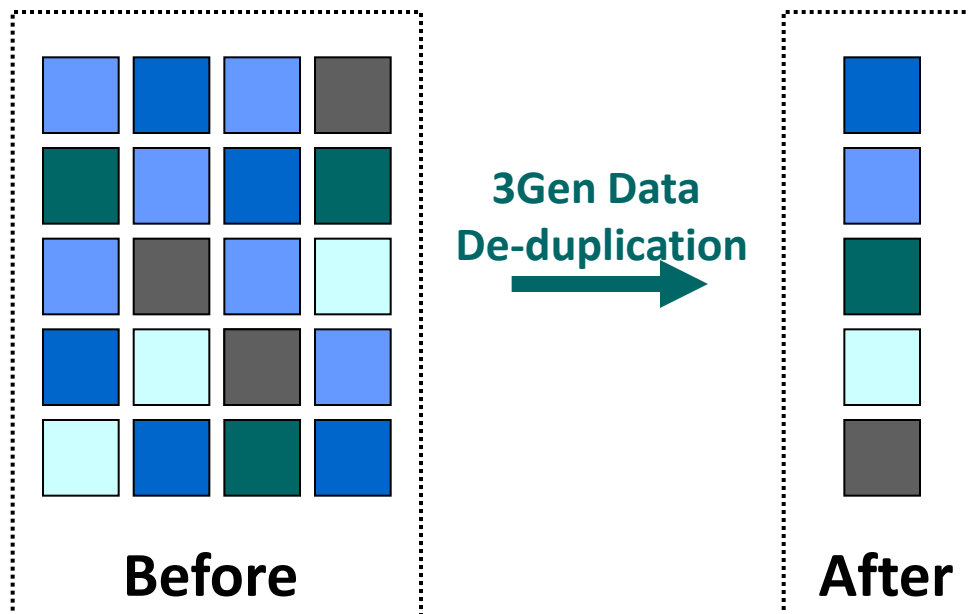
# Thin Provisioning features overview

- Design
  - 3Gen's dynamic design will assign data block(s) during write I/O operation. Most of our competitors use static design that will need to pre-assign data block during volume creation and then use volume expansion when pre-assigned space is 80% allocated.
- Automated Space Reclaimed
  - With 3Gen' dynamic design, no need to perform the waste space reclaim operations. With static design, customers need to run the waste space reclaim operation periodically in order to maintain the system integrity and performance.
- Predictable performance
  - 3Gen static design will maintain consistent system performance throughout the entire operation. With static approach, customer will experience significant performance degradation during volume expansion.
- Maximum Storage Utilization
  - Dynamic design ensure all allocated spaces are being used. With static design, pre-assigned data blocks could remains unused for long period of time.
- One Cloud Storage Architecture
  - All 3Gen cloud storage features such as data de-duplication, thin provisioning, and active-active clustering are designed under one single 3Gen Architecture. Our competitors have chosen to buy technologies instead of growing their own. This has lead to incomparable technology and architecture.

# 可提供Data De-duplication 資料重複刪除技術

## ○ Block based Data De-Duplication

- 節省資料儲存空間(35%~70%)
- 縮短資料備份時間(Backup Time)
- 提高資料處理效能
- 減輕網路頻寬負擔(Optimize network bandwidth)



# Data De-Duplication Comparison

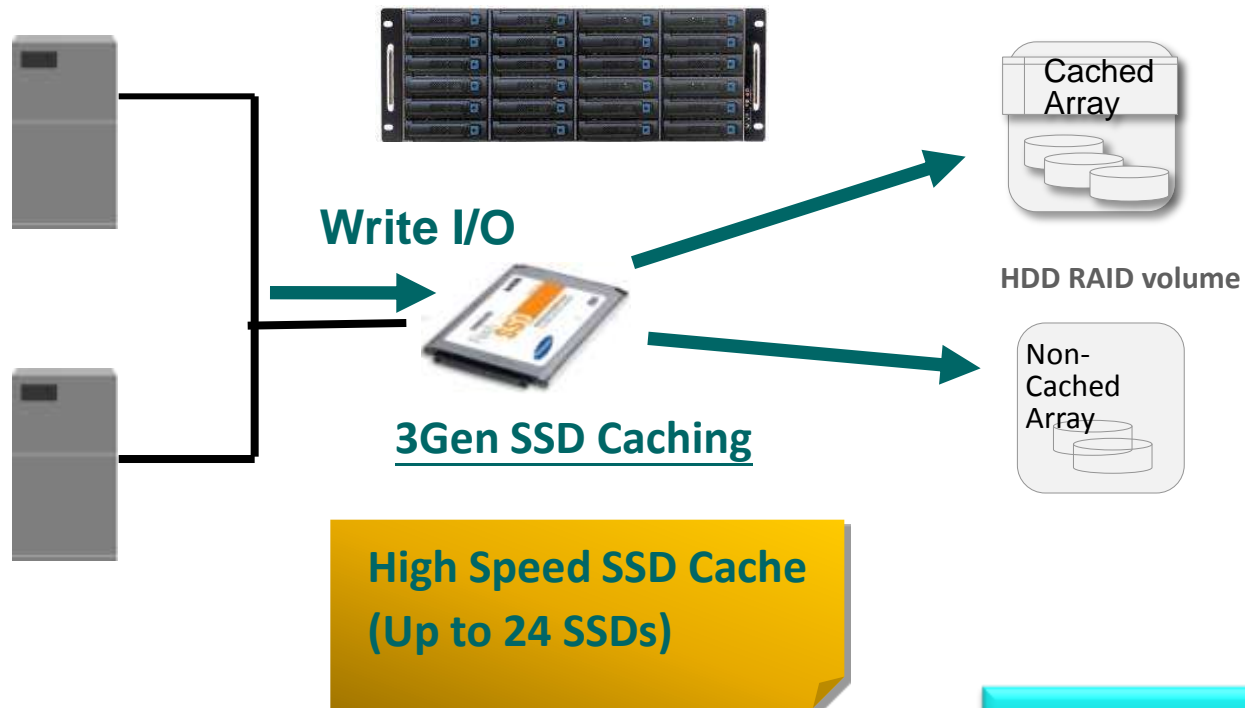
	3Gen	NetApp	EMC / Data Domain	IBM ProtectTier	Dell / Compellent
<b>Inline Proc.</b>	✓	Post processing	✓	Post processing	Life Cycle Management
<b>Location</b>	Storage	Storage	Storage	Server	Server
<b>Cross Logical Volume –File &amp; Protocol Agnostic</b>	✓	✓	✓	Backup	File Sensitive
<b>De-Dup. design</b>	CPU centric	Disk centric	CPU centric	CPU centric	CPU centric
<b>Variable length duplicates</b>	✓		✓		

# Data De-duplication features overview

- Inline processing vs. post processing
  - Inline processing will process the data as it arrives, therefore, it allows the maximum capacity savings
  - Post processing must have capacity to handle all the new arriving data, including duplicated data. A preferred method for outdated low power CPU platform
- Server based vs Storage based implementation
  - Server based will require data de-duplication software to be installed across all servers. Potential performance impact to application performance
  - Storage based allows all servers to participate in the benefits of data de-duplication without any proprietary software installation.
- Cross logical volume
  - Ability to detect duplicated data across a full range of protocols and application environments
- DeDup Algorithm – CPU Intensive vs Disk Intensive
  - Over the last two decades, CPU performance has increased 2,000,000 times. In that time, disk performance has only increased 11 times. Clearly, algorithms developed today for de-duplication should leverage the growth in CPU performance
- Fixed Block vs Variable length
  - Not all data changes are exactly 4KB in size and 4KB aligned. Sometimes people just replace one word with a longer word. Such a simple small replacement shifts all the rest of the data by some small amount. To a de-duplication engine built on fixed size blocks, the entire rest of the file would seem to be new unique data even though it really contains lots of duplicates.

# 可提供SSD Caching、加快存取速度

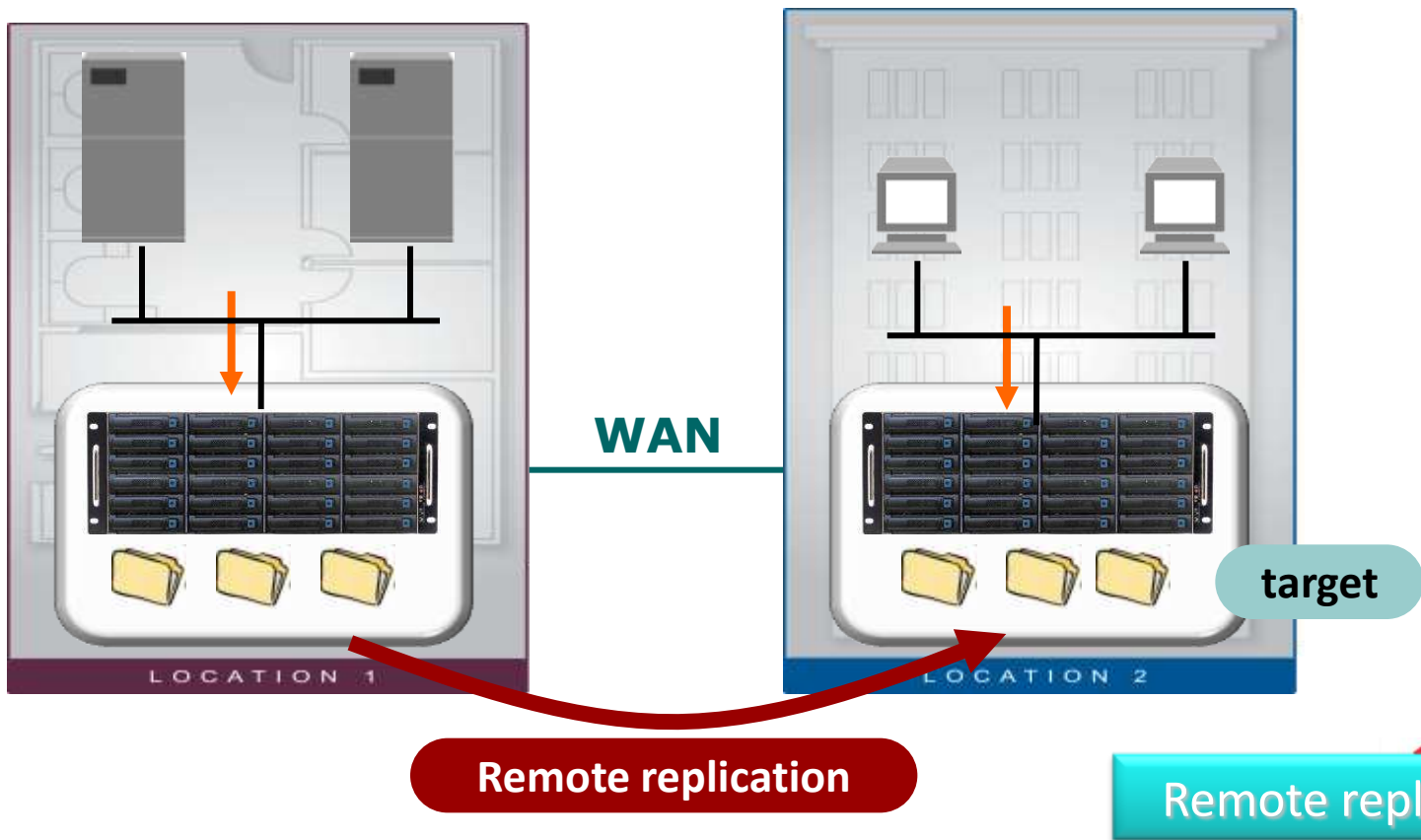
- High Performance
  - 可突破硬碟(HDD RAID Volume 5,6)效能瓶頸
  - Write Performance increase 35%
- High Data Availability
  - 數據寫入、無停電疑慮、Eliminat data Loss。



# 快速建置異地資料備份,資料保護

## File Level Remote replication 功能

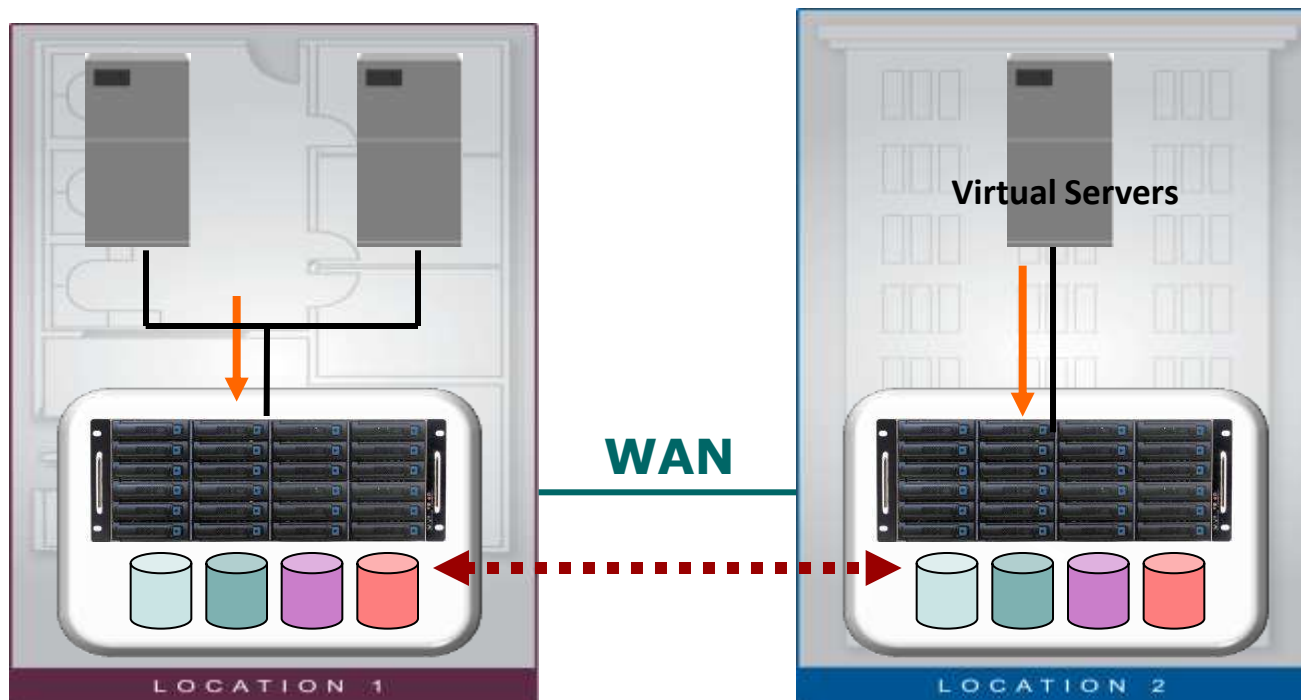
- File Level Remote replication - File 資料可複製至遠端儲存設備
  - 非同步(Asynchronous)傳輸方式。可設定排程時間。
- CDP - 連續性資料保護功能
  - 自動持續將資料以資料複製方式，備份到遠端設備。
  - 可不中斷資料保護，最多產生 5 分鐘的延遲。



# 符合成本效益的異地備援方案

## Block level Remote Data Mirroring 功能

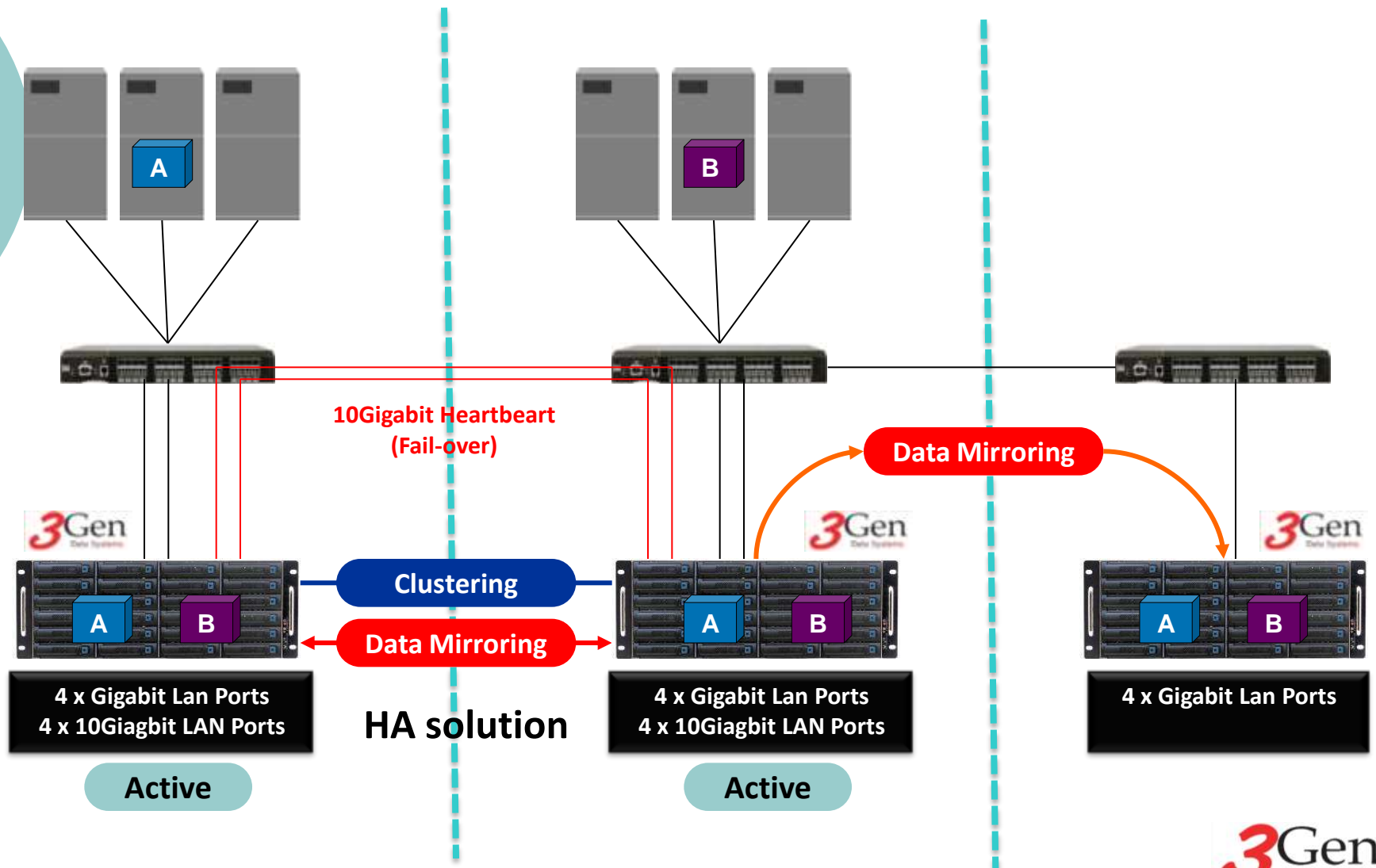
- Block level Remote Data Mirroring – 將Volume Data複製至遠端設備
  - 提供同步或非同步(Synchronous or Asynchronous) 傳輸方式
- 資料保護功能
  - 建立異地資料備份及異地備援機制



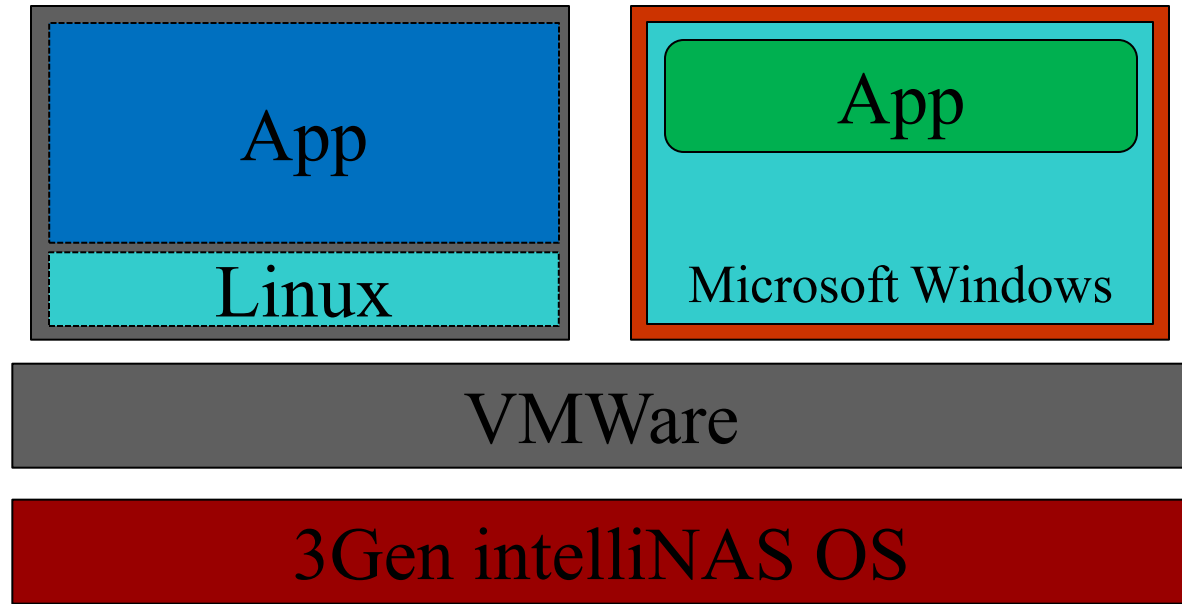
Remote Mirroring



# HA Solution + Data Mirroring Solution

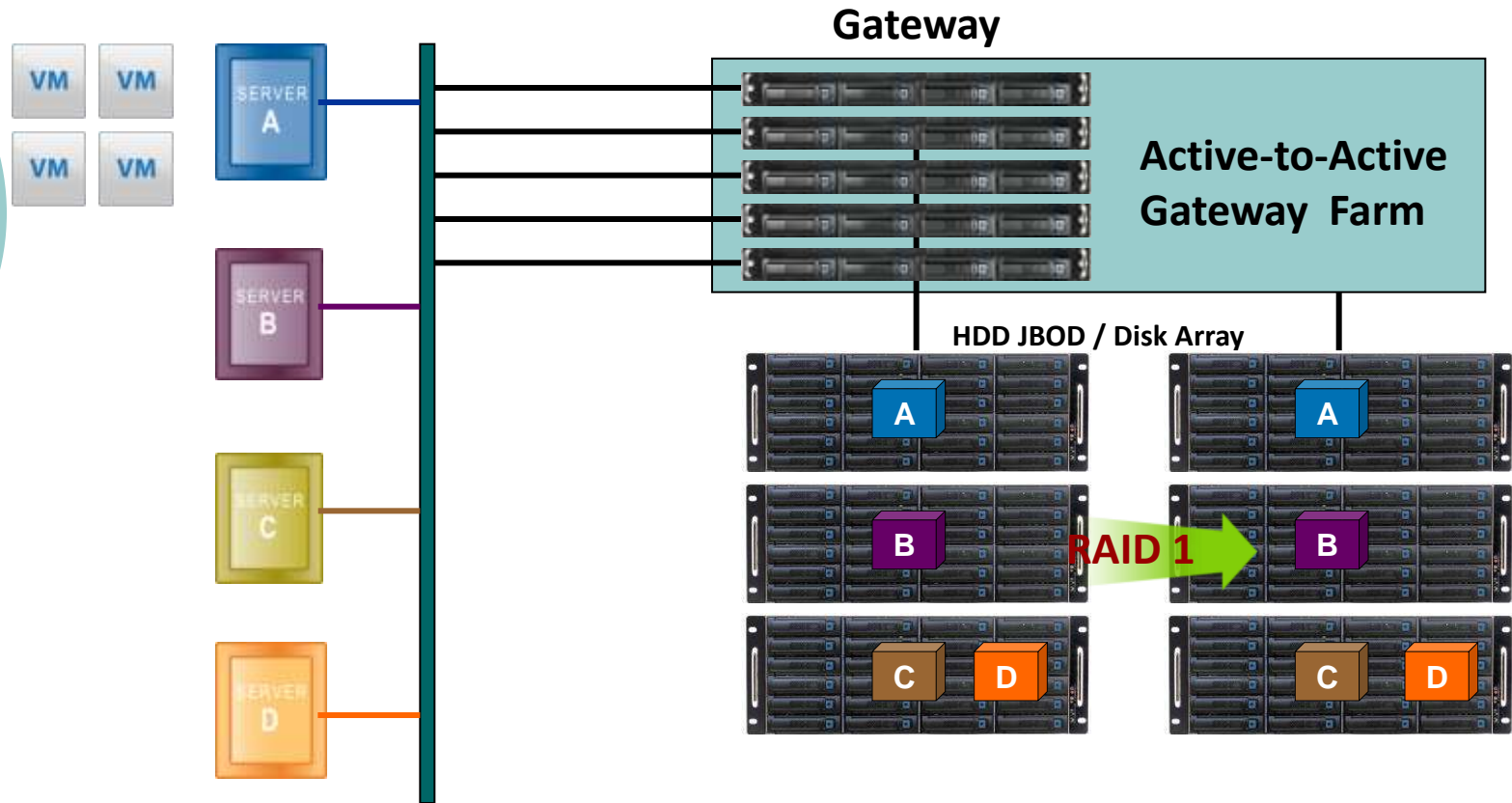


# 3Gen Virtualized Server Solution



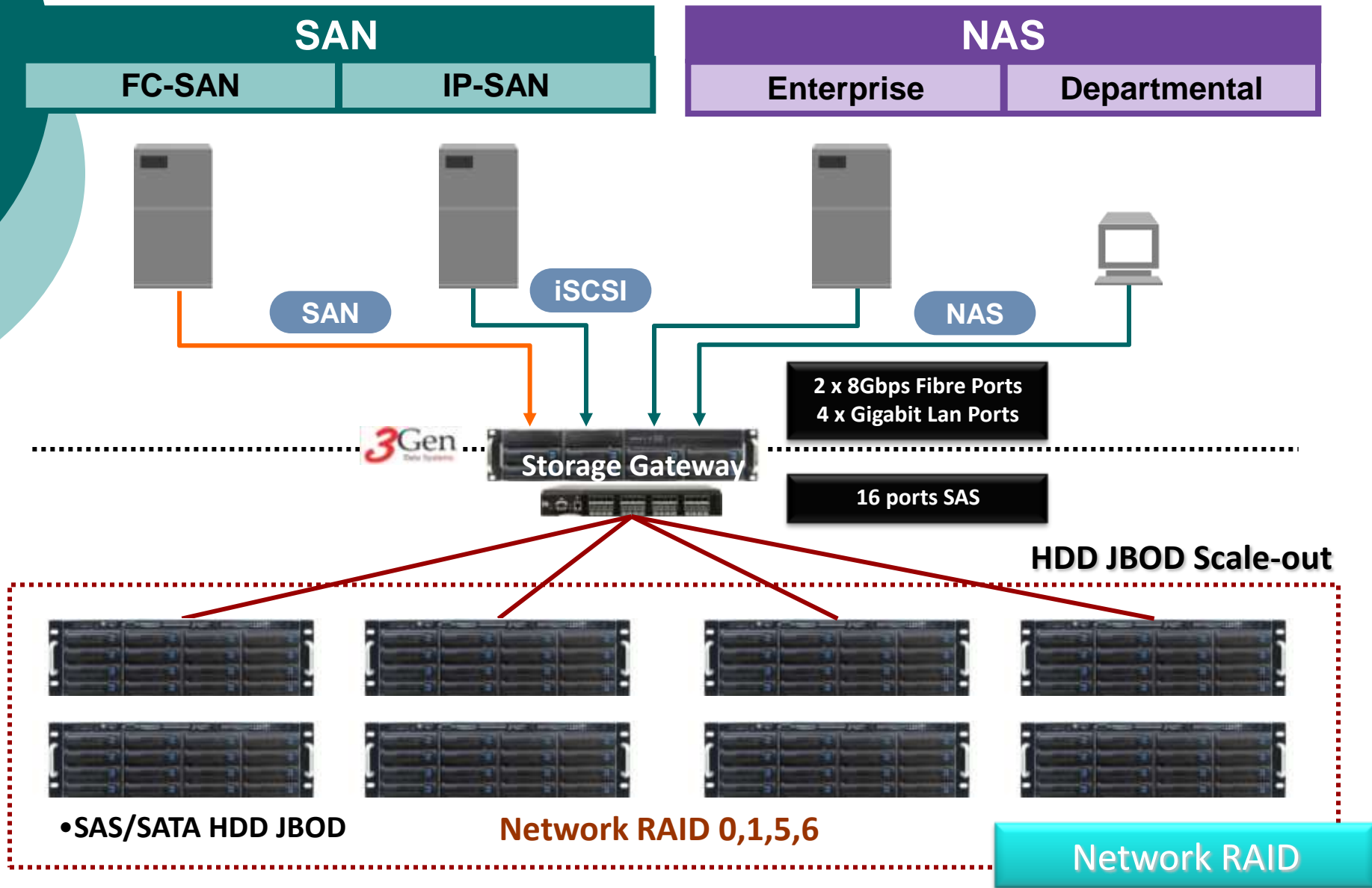
# 3Gen Scale-out 擴充架構

## Gateway clustering and HDD JBOD scable-out



- 原server負擔加重,可擴展storage controller,增加存取效能
- Server增加,可增加storage controller及HDD JBOD (Scable-out)
- 可達256台storage controller (active-to-active)
- 可使用3Gen Data Mirroring成為Network RAID架構

# 3Gen unified storage gateway and SAS/SATA HDD JBOD network RAID 0,1,5,6



# 3Gen unified storage gateway (Active-to-Active) and storage Network RAID 0,1,5,6

**SAN**

FC-SAN

IP-SAN

**NAS**

Enterprise

Departmental

Clustering can up to 256Nodes

Clustering

Active

V9040 Gateway



V9040 Gateway

Active/Passive



SAS Switch / Fibre Switch



Network RAID 0,1,5,6

- SAS HDD JBOD / SAS Disk Array
- Fibre Disk array

Scale-out / up

Controller Clustering

Network RAID



# 3Gen WORM NAS Solution

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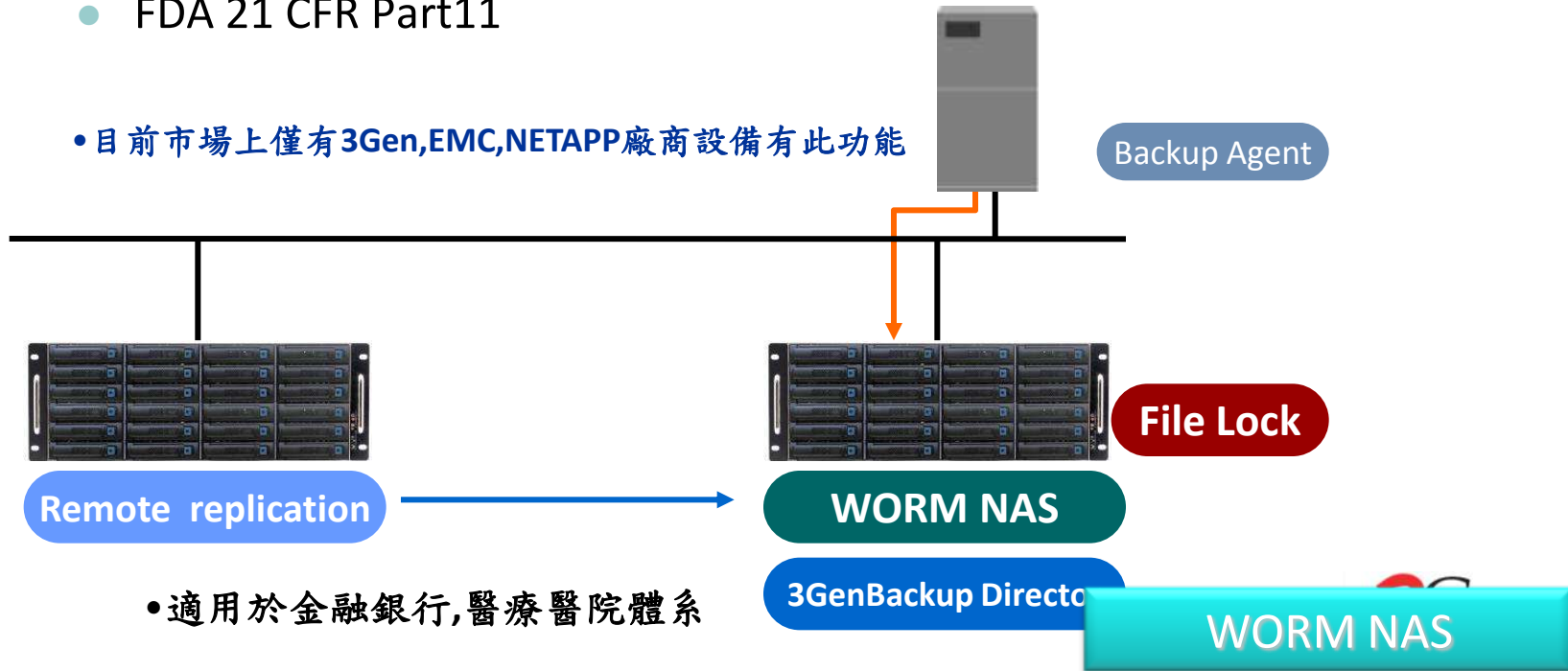
# Why and Who needs WORM

- 2001年恩隆案和2009年的全球金融風暴！
  - 美國規範超過4000項的規定，並繼續增加
  - 主要記錄要求被完整保留
  - 美國金融企業需符合美國證券交易委員會的法規(SEC 17a-4)：強制要求資料之保存期限
  - 醫藥公司需符合FDA 21 CFR第11部分：要求稽核數據的安全性及完整性
  - 美國所有的上市公司需符合美國證券交易委員會沙賓法案(SEC Sarbanes Oxley)：要求數據之保護及不可變動性
  - 如果不遵守可能會導致重大的財務風險，和強制罰款
- 病毒攻擊
  - Code Red, 2001: 癱瘓微軟IIS伺服器,造成2.6億美元損失
  - Sasser, 2004: 入侵微軟作業系統弱點，並在三日內出現變種，在全世界造成5.5億美元損失
- 故意或人為資料損毀
  - 60%的資料損毀是由人為錯誤造成
  - 人為操作的錯誤和惡意員工會造成公司重大經濟和生產力損失
- **3Gen WORM NAS**
  - 以磁碟為基礎的資料保存技術，提供資料保存及不可否認性的單一解決方案
  - 符合SEC 17a-4 / SEC Sarbanes Oxley / FDA 21 CFR Part11 .認證

# 3Gen WORM NAS (write once read many)

- WORM NAS一寫多讀儲存設備,可取代磁帶備份
- WORM機制需具備資料不可否認性Data Compliance
  - 具備File Lock作用,檔案可永久不更改、刪除、異動
  - 儲存於的檔案是不可以變動、不可刪除
  - 資料夾可個別記錄資料之保存期限,資料可在期限過後被刪除
- 吻合主要WORM依循的認證
  - 美國證券交易委員會沙賓法案(SEC Sarbanes Oxley )
  - 美國證券交易委員會的法規(SEC rule 17a-4)
  - FDA 21 CFR Part11

• 目前市場上僅有3Gen,EMC,NETAPP廠商設備有此功能



• 適用於金融銀行,醫療醫院體系



# 3Gen WORM NAS 主要特點

- 靈活的資料保存政策
  - 允許資料夾層面(folder level)的資料保存政策
  - 預設保存期限- 1年
- Compliance and Governance
  - File Level WORM功能以確保儲存資料的不變性，以提高工作效率
- 符合認證查核
  - 3Gen WORM NAS 設計來提供需查核的儲存檔案沒有被修改過的證明，從檔案一開始儲存在3Gen WORM NAS上
- 動態轉換WORM
  - 3Gen WORM NAS 獨特的功能，將原本可Read/Write 硬碟磁區動態轉換為WORM磁區。不需要另外增加軟硬體設備
- 預防竄改機制
  - 3Gen WORM NAS 如果偵測到未經授權的非法入侵竄改(比如修改系統時間、硬體設備更換)。系統將會自動關機，以確保資料安全



# WORM NAS 與其他儲存設備比較

	MO	Tape	<b>3Gen WORM NAS</b>
容量	<10GB/media	<1.5TB/media	4 to 248TB
單位成本	\$10/GB plus	\$ 5/GB plus	<\$1.00/GB
效能	以分計	以小時計	以秒計
存取方式	Near-Line	Off-Line	Online
管理容易度	Medias過多管理困難	過多TAPE管理困難	單一儲存系統管理容易
資料保護層級及保存成本	離線保存- 成本高昂	離線保存- 成本高昂	能做叢集、快照及異地存放 Clustering, Snapshot, Remote file and block level Replication

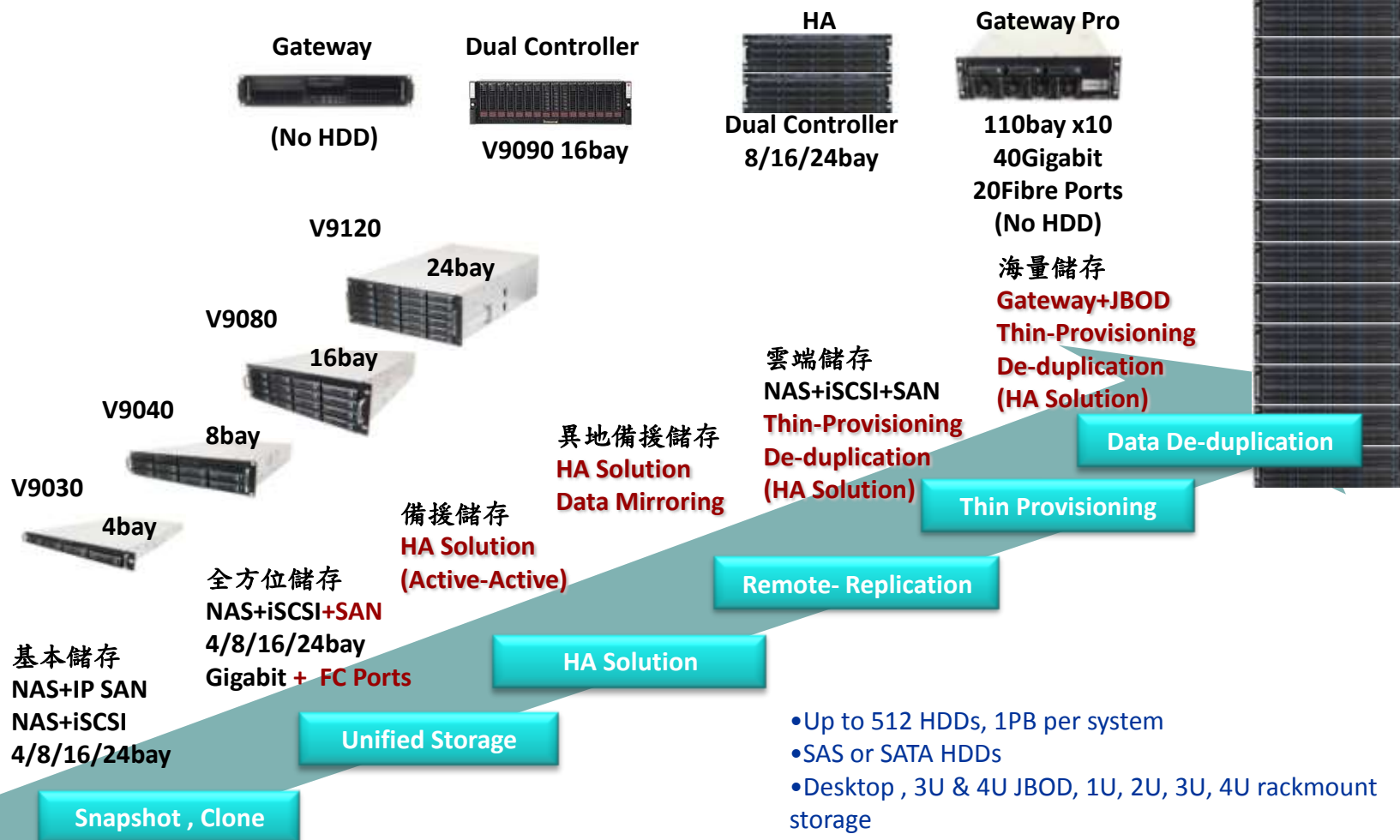
# 3Gen Storage 產品線及規格

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# 3Gen Storage 齊全產品線解決客戶需求

資料集中化及效能

Storage  
HDD JBOD



業務連續性和可用性

# 3Gen unified storage family



## ○V9040

- 8 x 3.5" SAS / SATA Disks
- NAS & IP SAN (iSCSI)

## ○V9030

- 4x 3.5" SATA Disks
- NAS & IP SAN (iSCSI) support



## ○V9080,V9080Pro

- 16-24 x 3.5" SAS / SATA Disks
- SAN (Fibre) & NAS & iSCSI
- 110 SAS / SATA Disks

## ○V9120,V9120Pro

- 16-24 x 3.5" SAS / SATA Disks
- SAN (Fibre) & NAS & iSCSI
- 660 SAS / SATA Disks

### Dual controller



## ○V9090Pro

- 16 x 3.5" SAS / SATA Disks
- SAN (Fibre) & NAS & iSCSI
- 110 SAS / SATA Disks

- **Dual Controller (Active/Active)**
- **Dual Controller (Active/Passive)**

### Storage Gateway



## ○V9080Pro Storage Gateway

- 3 x 3.5" SAS / SATA Disks
- SAN (Fibre) & NAS & iSCSI
- 10 组 8x PCI-e Slot

## ○V9040Pro Storage Gateway

- SAN (Fibre) & NAS & iSCSI
- 4 Gigabit LAN
- 3x 8X PCI-e / 1 x 4XPCI-e Slot

### HDD JBOD



## ○SAS /SATA JBOD

- 16 x 3.5" SAS / SATA Disks
- 2 SAS Ports
- 110 SAS / SATA Disks

## ○SAS /SATA JBOD

- 24 x 3.5" SAS / SATA Disks
- 2 SAS Ports
- 110 SAS / SATA Disks

# 3Gen Storage Product Overview

## 高效能,高可用性儲存設備



1U4BAY		2U8BAY		3U16BAY		4U24BAY	
V9030	V9040	V9080	V9080Pro	V90120Pro	SAS JBOD		
1U4Bay	2U8Bay (up to 480 bay)	3U16Bay (up to 480 bay)	3U16Bay (up to 720 bay)	4U24Bay (up to 720 bay)	3U16Bay 4U24Bay /60Bay		
3.5" or 2.5" SAS/SATA HDD			3.5" or 2.5" SAS/SATA HDD				
Quad Core E3-1220 Xeon			Qual Core Xeon 5606 x 2				
1GB RAM	4GB RAM	8GB RAM	16GB RAM (Max:192GB)				
2 Gigabit	2 Gigabit	2 Gigabit	4 Gigabit				
4-in-1 Backplane	4-in-1 Backplane	4-in-1 Backplane	4-in-1 Backplane		SAS Expander		
RAID 0,1,5,6	6Gb SAS RAID 0,1,5,6(or SAS RAID Kit)		6Gb SAS RAID 0,1,5,6(or SAS RAID Kit)				
1 x 8XPCI-e	2 x 8XPCI-e 1 x 4XPCI-e	2 x 8XPCI-e 1 x 4XPCI-e	3 x 8XPCI-e 1 x 4XPCI-e	3 x 8XPCI-e 1 x 4XPCI-e	3 SAS Ports 120 bay		
500W Power	800W x2 Power	800W x2 Power	800W x2 Power	1010W x2 Power	400W x2 Power		
3Gen IntelliNAS – NAS + iSCSI / Online Volume Expansion/Snapshot & Clone /File Level Remote Replication							
Option- (1) FC-4G (2) FC-8G (3) 10Giga LAN/Dynamic Thin Provision /Data De-Duplication (Block Level) / SSD Cacheing / Block Level Remote Data Mirroring/ HA Clustering+ Data mirroring) / WORM (File Lock)/AES 256 Volume level Encryption							

- 系統核心可選擇將作業系統核心做Mirror，更確保系統資料安全無慮。(V9040以上)

# 3Gen clustering Storage and unified gateway Product

高安全性容錯機制儲存設備,海量儲存設備



V9040 Gateway	V9040Pro Gateway	V9080Pro Gateway	V9090Pro
NO HDD ( use SAS/SATA HDD JBOD )			3U16Bay(up to 240 bay)
<b>Storage Gateway</b>			<b>Dual Controller</b>
Quad Core E3-1220 Xeon / Qual Core Xeon 5506 x 2			Qual Core Xeon 5506 x 2 x2
4GB RAM	16GB RAM	16GB RAM	16GB RAM x 2
2 Gigabit	4 Gigabit	4 Gigabit	2 Gigabit x 2
1 SAS Port	16 SAS Ports (with SAS Switch)	Max: 20 SAS Pots	SAS Expander
6Gb SAS RAID 0,1,5,6(or SAS RAID Kit)			6Gb SAS RAID 0,1,5,6(or SAS RAID Kit)
2 x 8XPCI-e 1 x 4XPCI-e	3 x 8XPCI-e 1 x 4XPCI-e	10 x 8XPCI-e (Max: 40 Pots FC / 40 Ports LAN)	1 x 8XPCI-e 2 x 4XPCI-e
500W x2 Power	500W x2 Power	800W x2 Power	1200W x2 Power
3Gen IntelliNAS – NAS + iSCSI / Online Volume Expansion/Snapshot & Clone /File Level Remote Replication Option- (1) FC-4G (2) FC-8G (3) 10Giga LAN/Dynamic Thin Provision /Data De-Duplication (Block Level) / SSD Cacheing / Block Level Remote Data Mirroring/ HA Clustering+ Data mirroring) / WORM (File Lock)/AES 256 Volume level Encryption			

# Features and Benefits

- Unified Storage ( 統一儲存 )
  - Support network (NAS、iSCSI) and SAN (Fibre)
  - SAN Storage Gateway (FC as initiator and target)
- Availability ( 可用性 )
  - Block level Snapshot
  - Volume Clone
  - Remote replication
  - Easy configuration and management
- Security ( 安全性 )
  - RAID 0,1,5,6
  - AES 256 Volume level Encryption
  - Clustering (Active-Active and Active-Passive)
  - Remote Block level Synchronous and Asynchronous Mirroring
  - WORM (Write Once Read Only) NAS
- Scalability ( 可擴展性 )
  - Online Volume Expansion
  - Thin provisioning
  - Block level Data De-Duplication
- Performance ( 效能 )
  - SSD Caching



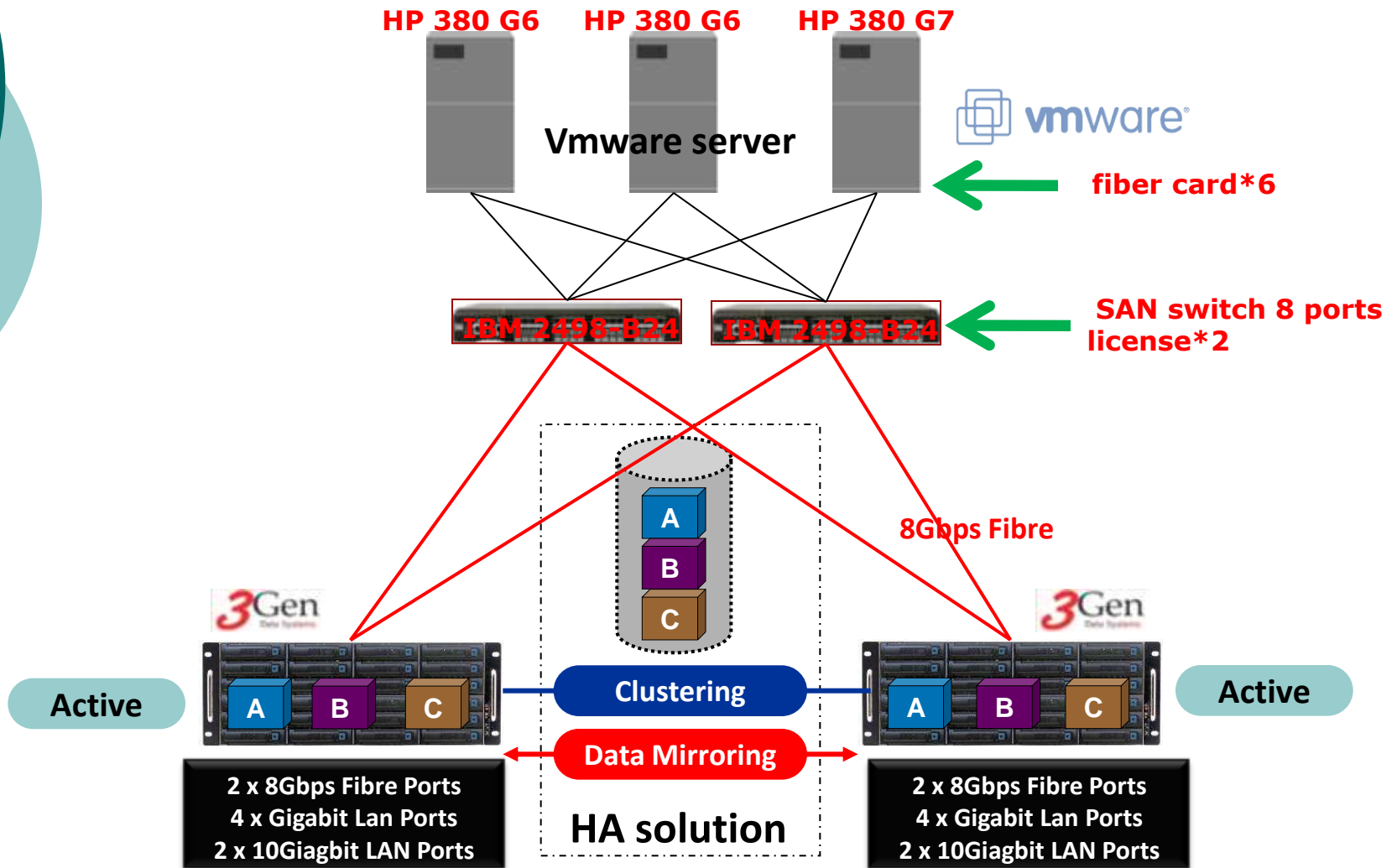


## 客戶實績

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- HA (Active-Active )
  - Storage Clustering + Synchronous Data Mirroring
- HA Solution + SAN Fail over
- Remote Replication + Data Mirroring
- HA Solution+ Data Mirroring
- Storage Gateway Clustering

# 某企業 Storage HA 架構圖

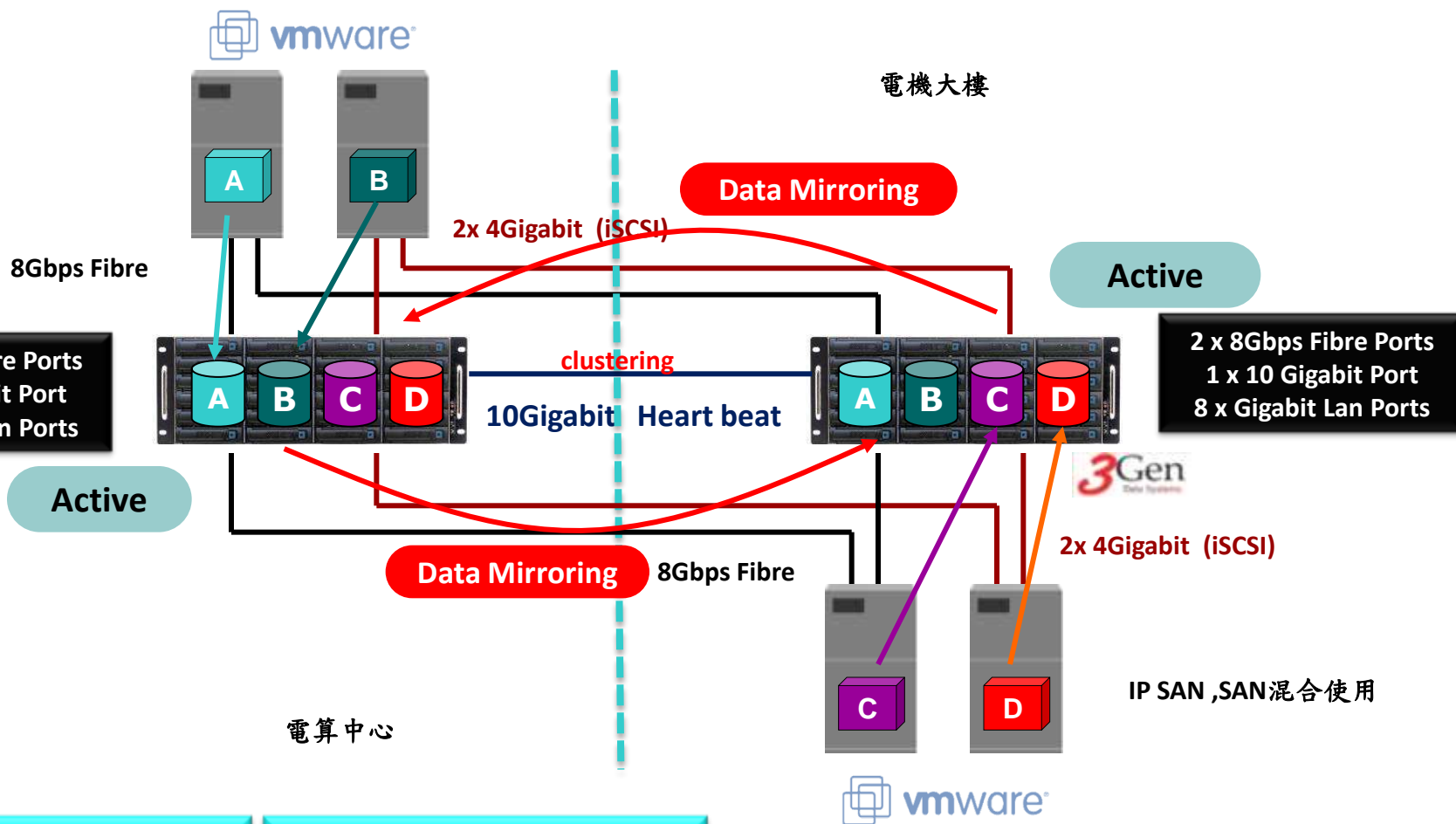


3Gen V9080Pro x 2

Unified Storage

HA Solution

# 新竹某國立大學\_HA (Active-Active) Storage Clustering + Synchronous Data Mirroring



3Gen V9080Pro x 2

HA Solution

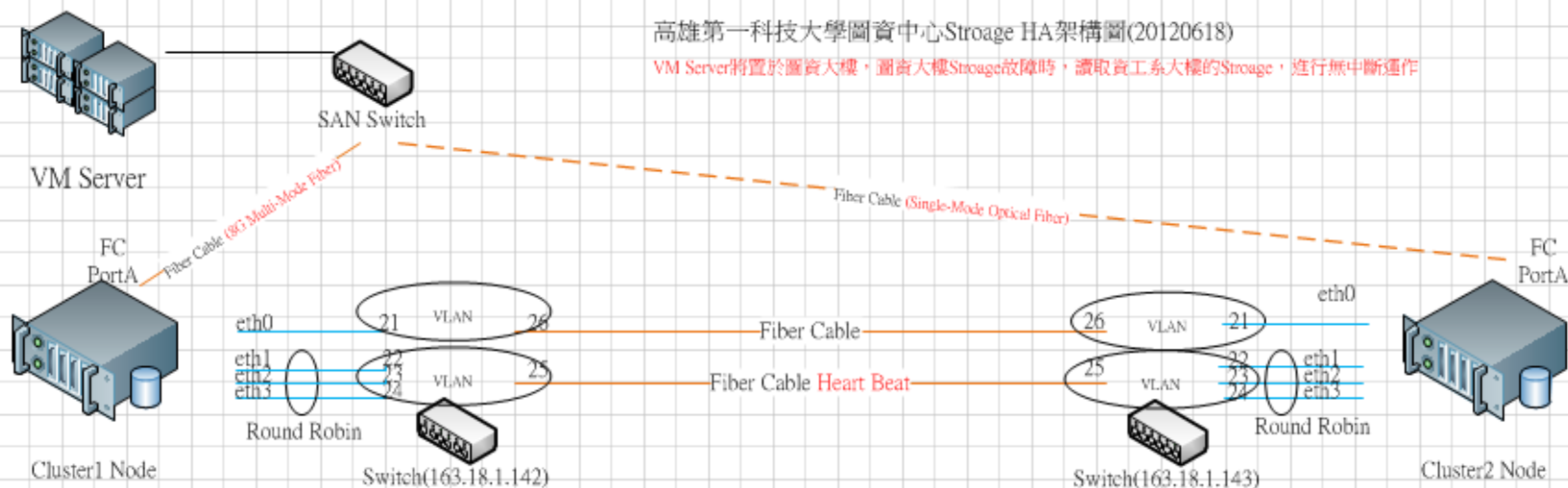
Unified Storage

SSD Caching

# 高雄某科技大學圖資中心-實際架構

高雄第一科技大學圖資中心Storage HA架構圖(20120618)

VM Server將置於圖資大樓，圖資大樓Storage故障時，讀取資工系大樓的Storage，進行無中斷運作



## 圖資大樓

### Cluster1 node:

eth0 IP: 163.18.1.152

bond0 IP:10.0.0.2 (heartbeat)

eth1 IP: 10.0.0.2

eth2 IP: 10.0.0.2

eth3 IP: 10.0.0.2

(Set eth1,eth2 and eth3 as the bonding at Adaptive Load Balance mode)

## 資工系大樓

### Cluster2 node:

eth0 IP: 163.18.1.153

bond0 IP:10.0.0.3 (heartbeat)

eth1 IP: 10.0.0.3

eth2 IP: 10.0.0.3

eth3 IP: 10.0.0.3

(Set eth1,eth2 and eth3 as the bonding at Adaptive Load Balance mode)

Cluster VIP:163.18.1.151

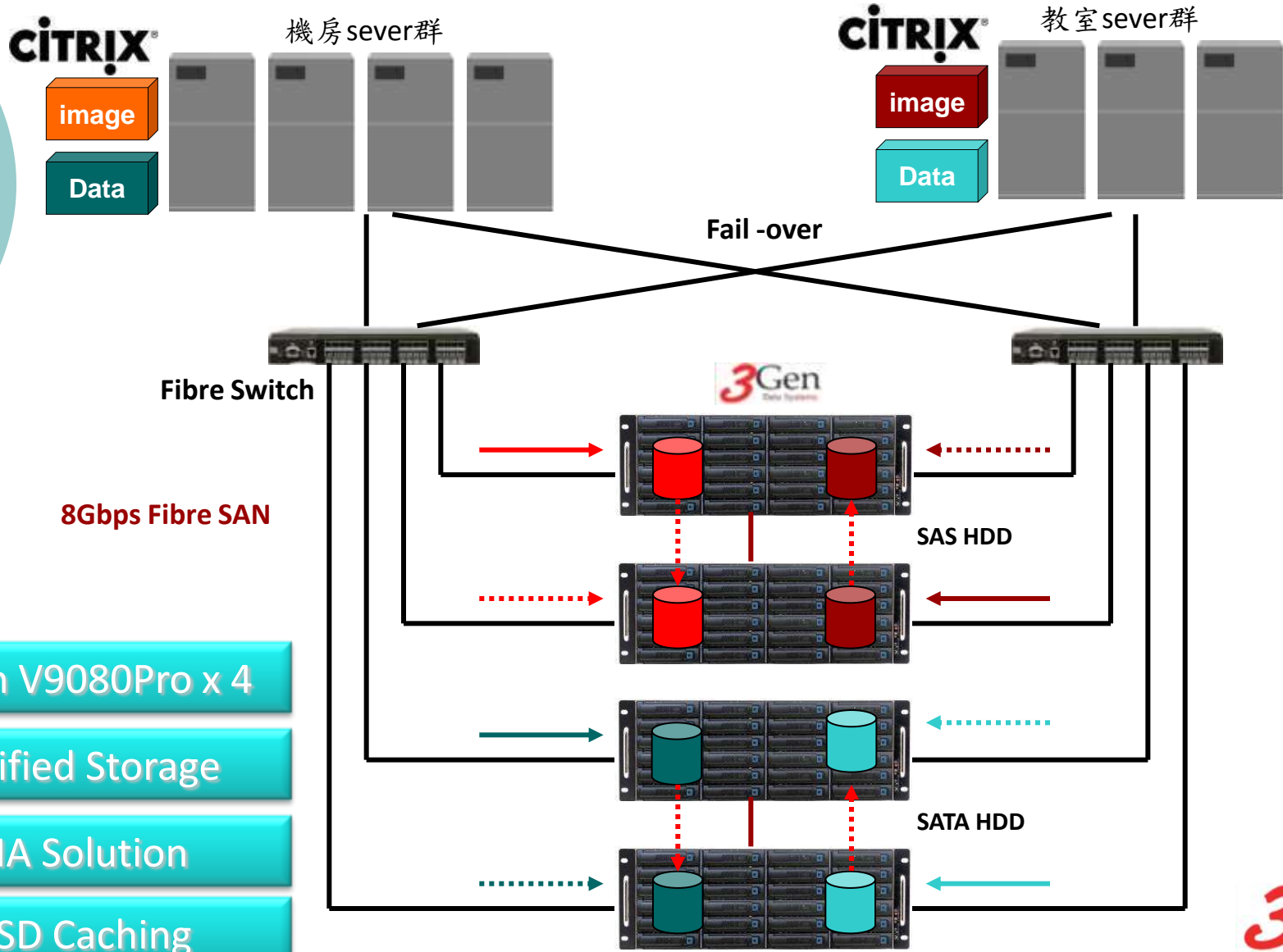
DNS IP :163.18.1.7 & 163.18.11.7

Gateway IP:163.18.1.254

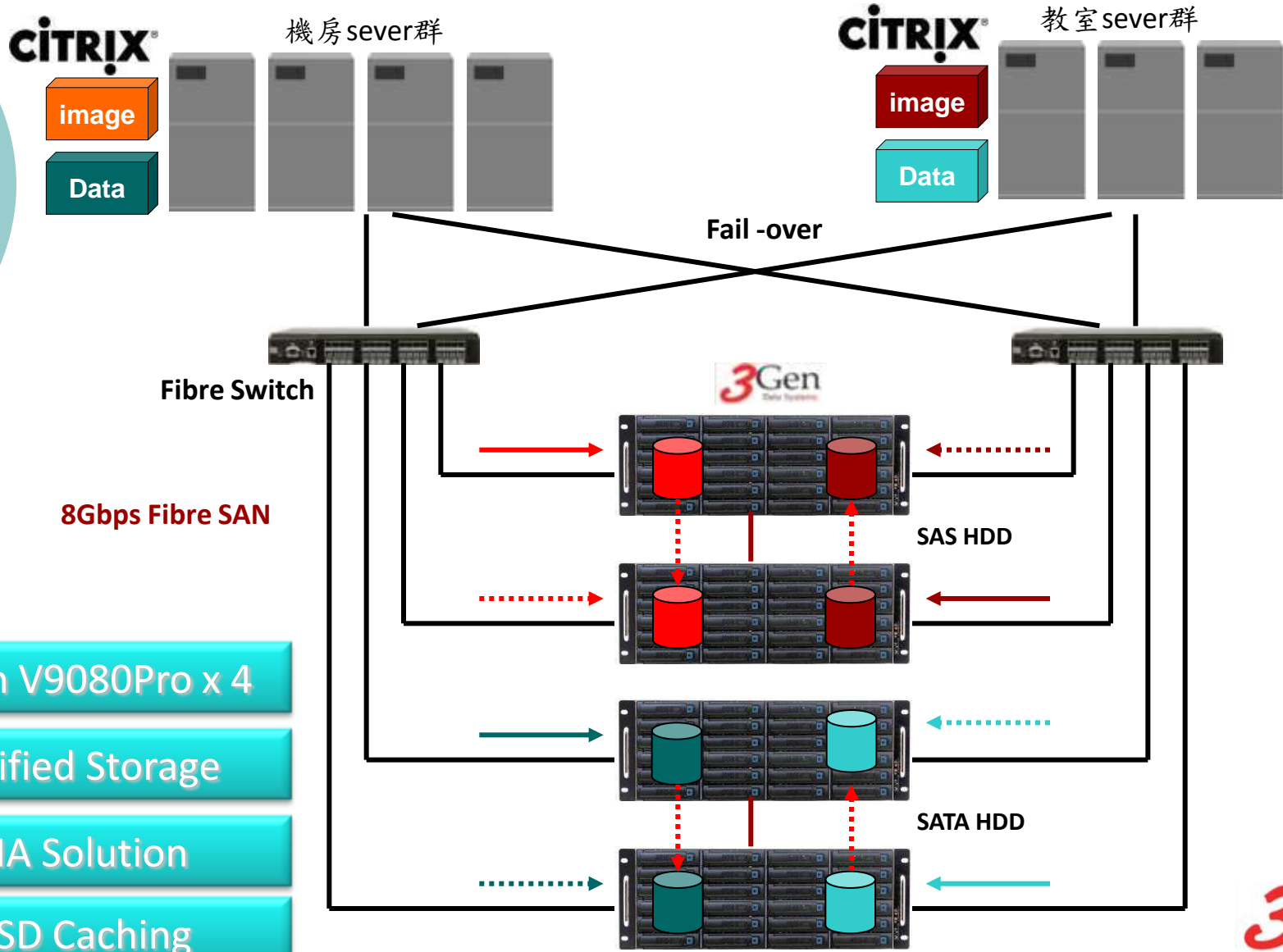
Cluster1 port(eth0) IP: 163.18.1.152

Cluster2 port(eth0) IP: 163.18.1.153

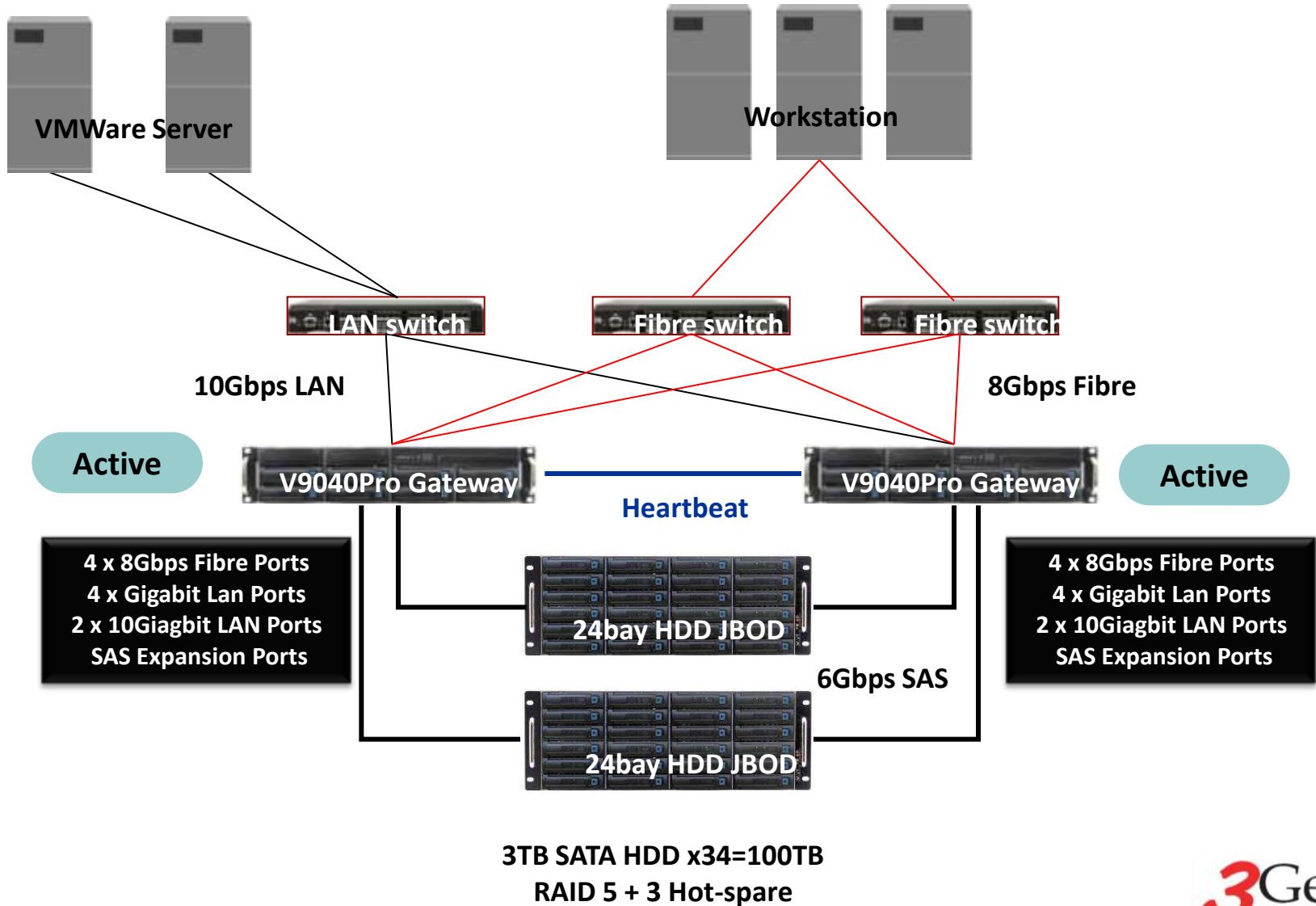
# 台南某私立大學\_HA Solution + SAN Fail over



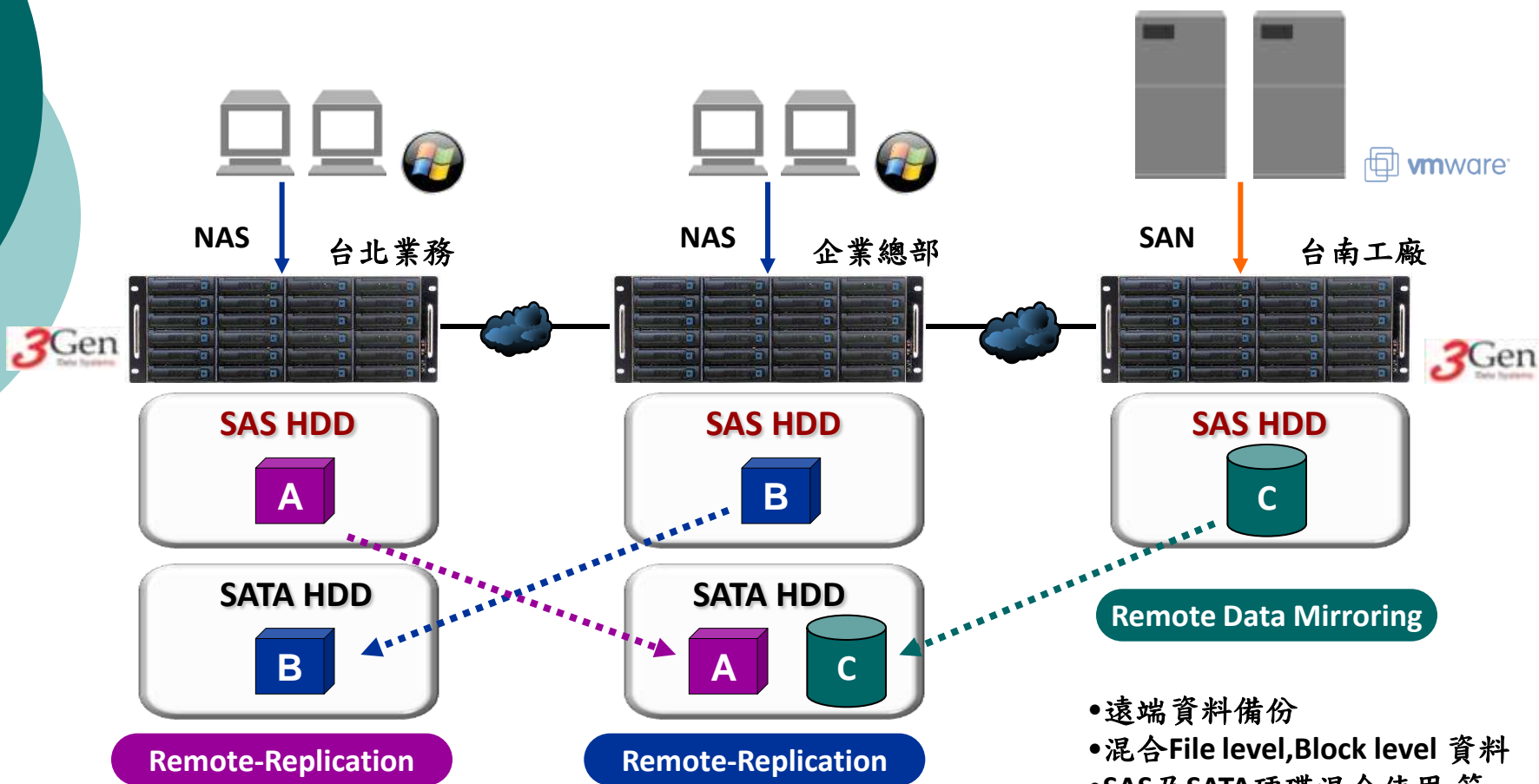
# 台南某私立大學\_HA Solution + SAN Fail over



# 某電視台架構圖-unified storage solution



# 某出版事業-Remote Replication + Data Mirroring



- 遠端資料備份
- 混合File level,Block level 資料
- SAS及SATA硬碟混合使用,節省建置成本

3Gen V9080Pro x 3

Data Mirroring

De-duplication

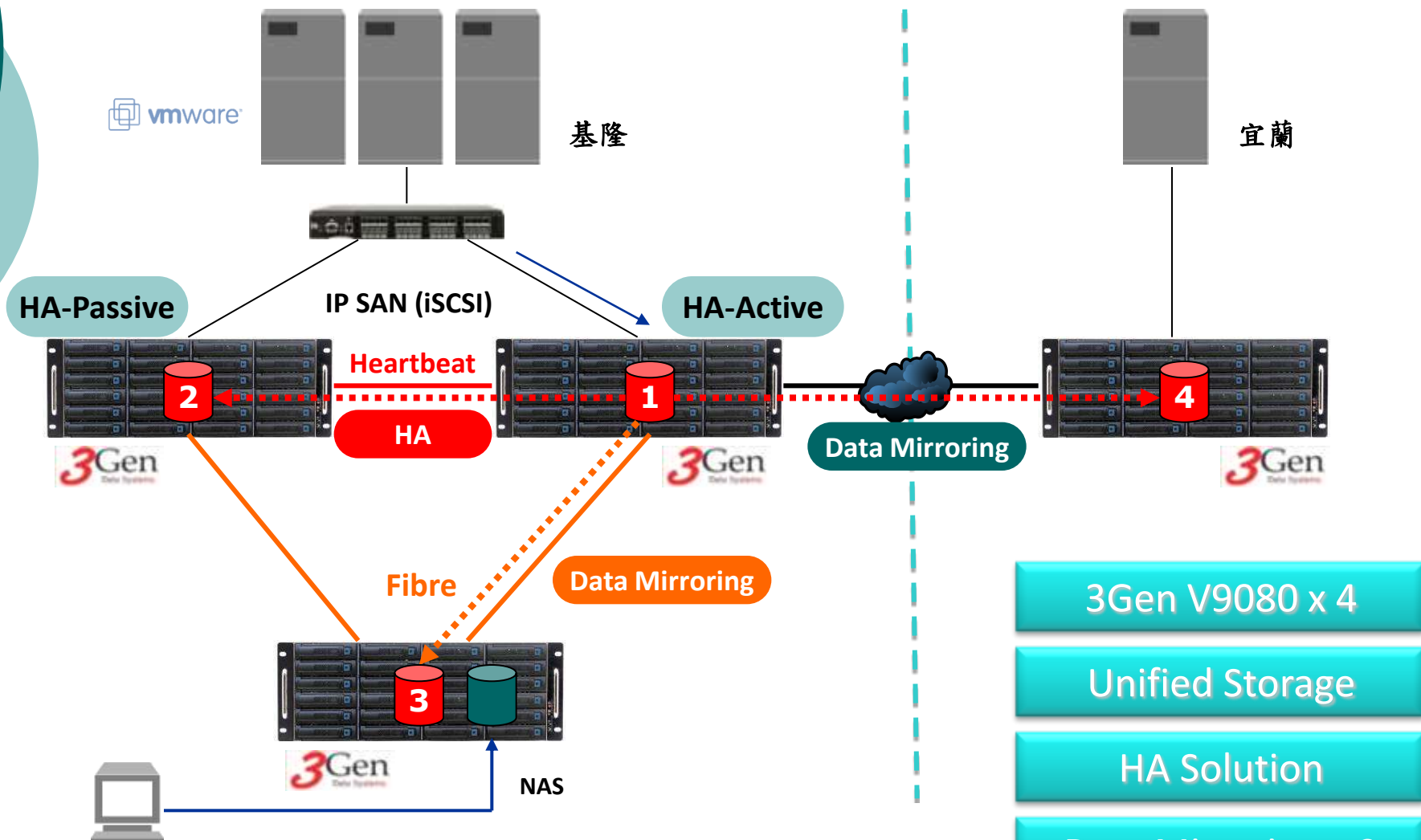
Unified Storage

SSD Caching

Thin-Provisioning



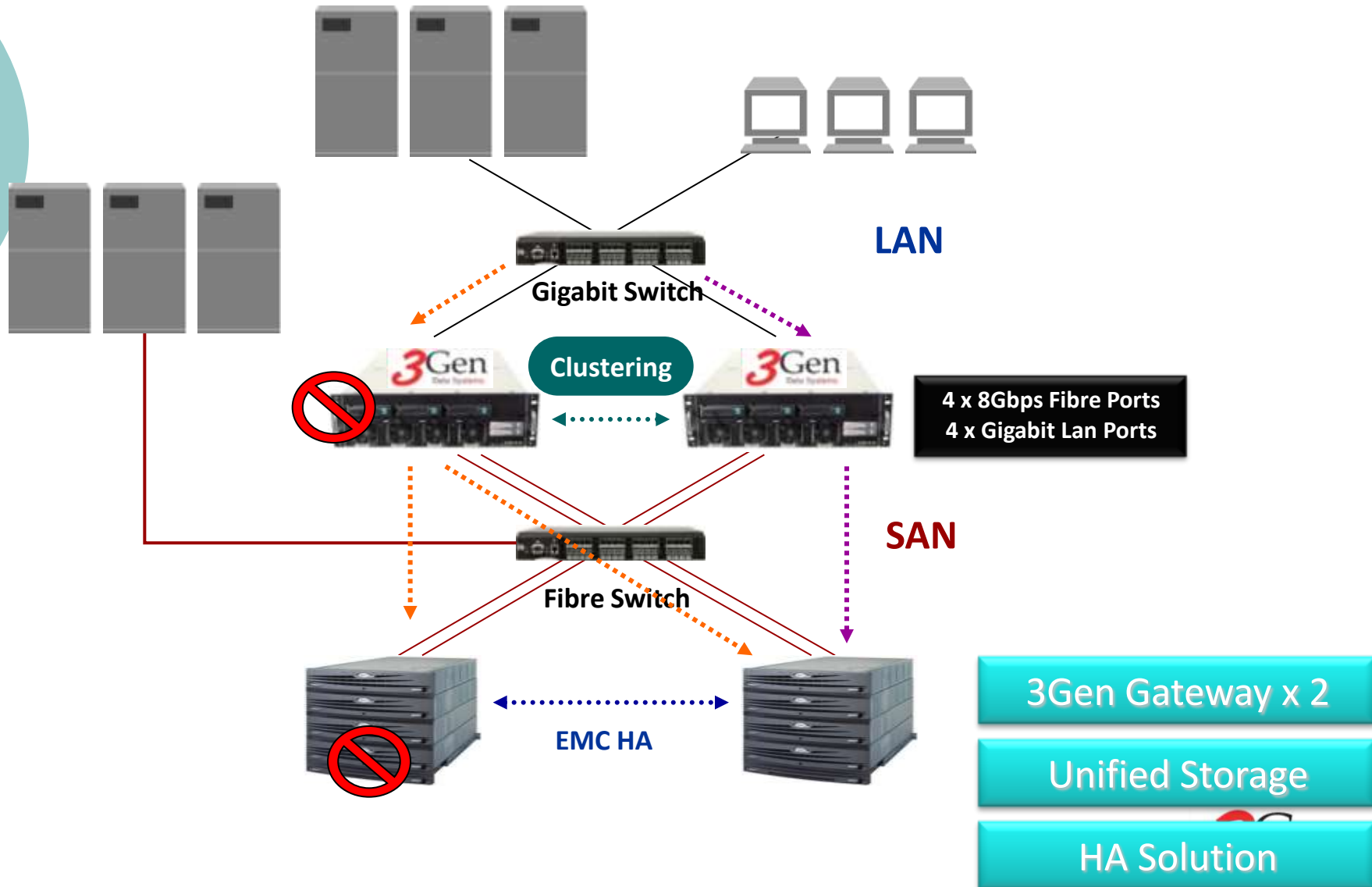
# 北部某網路中心-HA Solution+ Data Mirroring



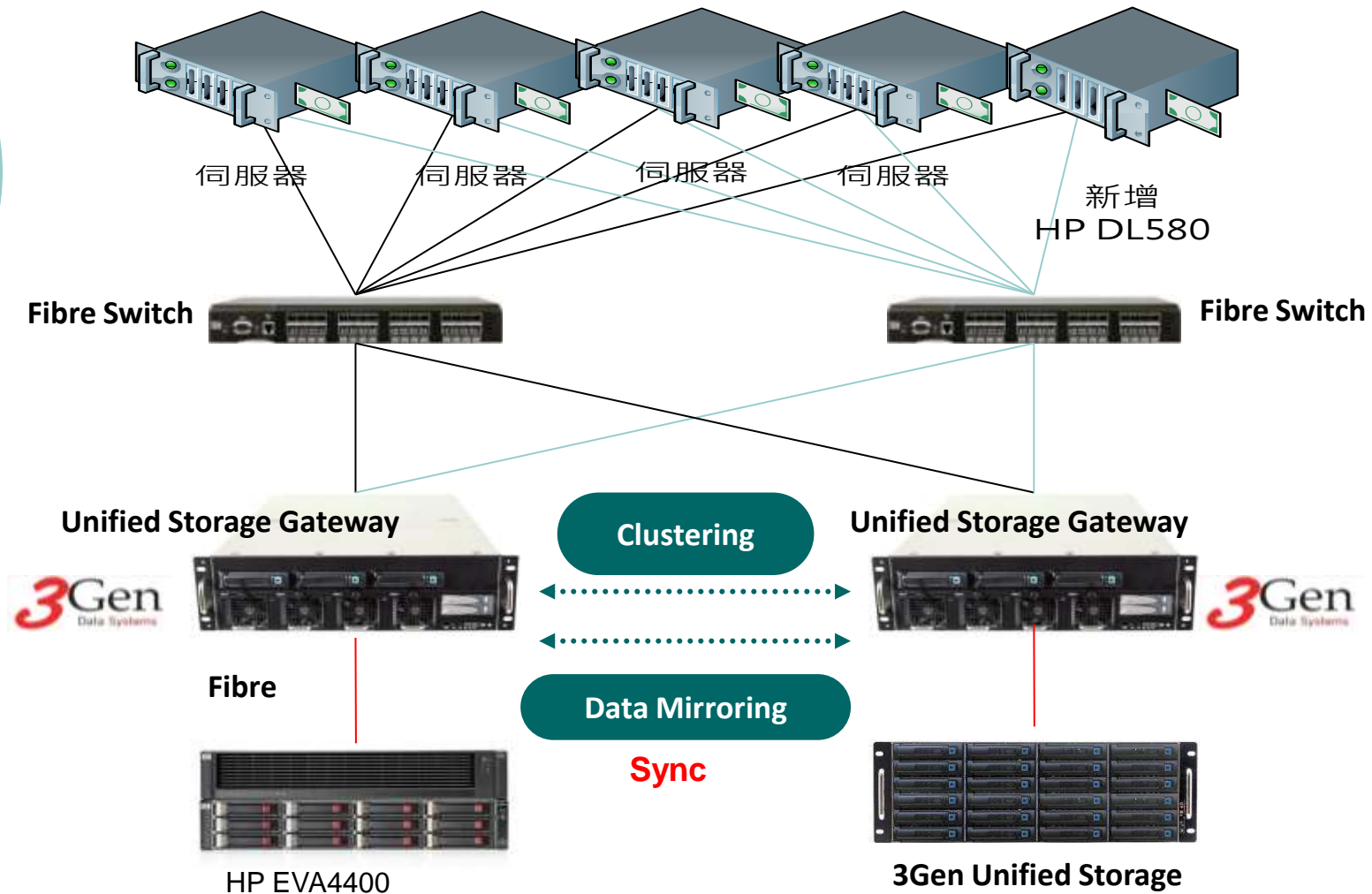
- 本地端HA機制,異地端備援機制
- 資料複製4份

# 國際知名大企業

## Storage Gateway Clustering (整合EMC Storage)

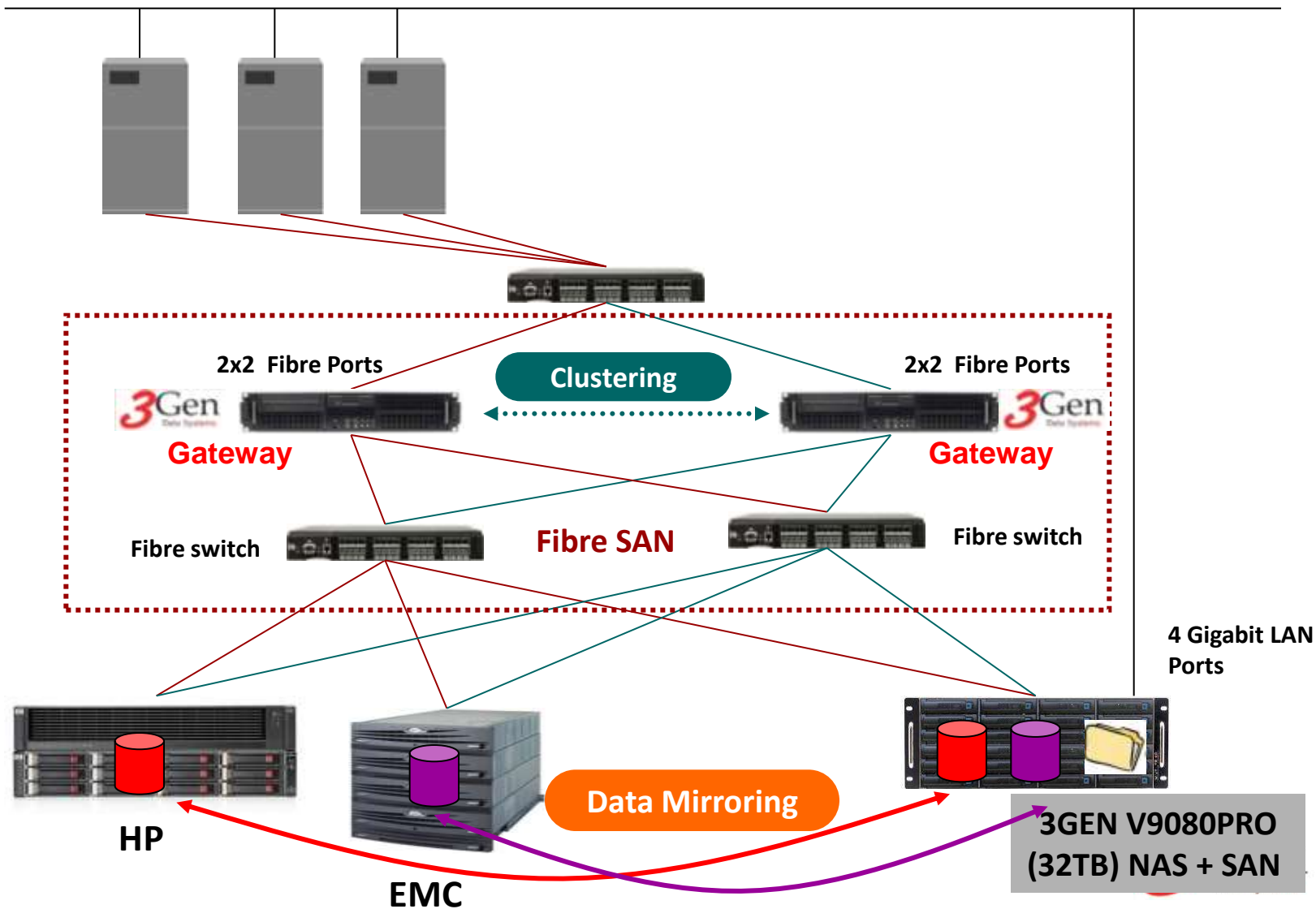


# Storage Gateway HA (Active-Active) - 整合HP Storage Clustering + Synchronous Data Mirroring(規劃中)



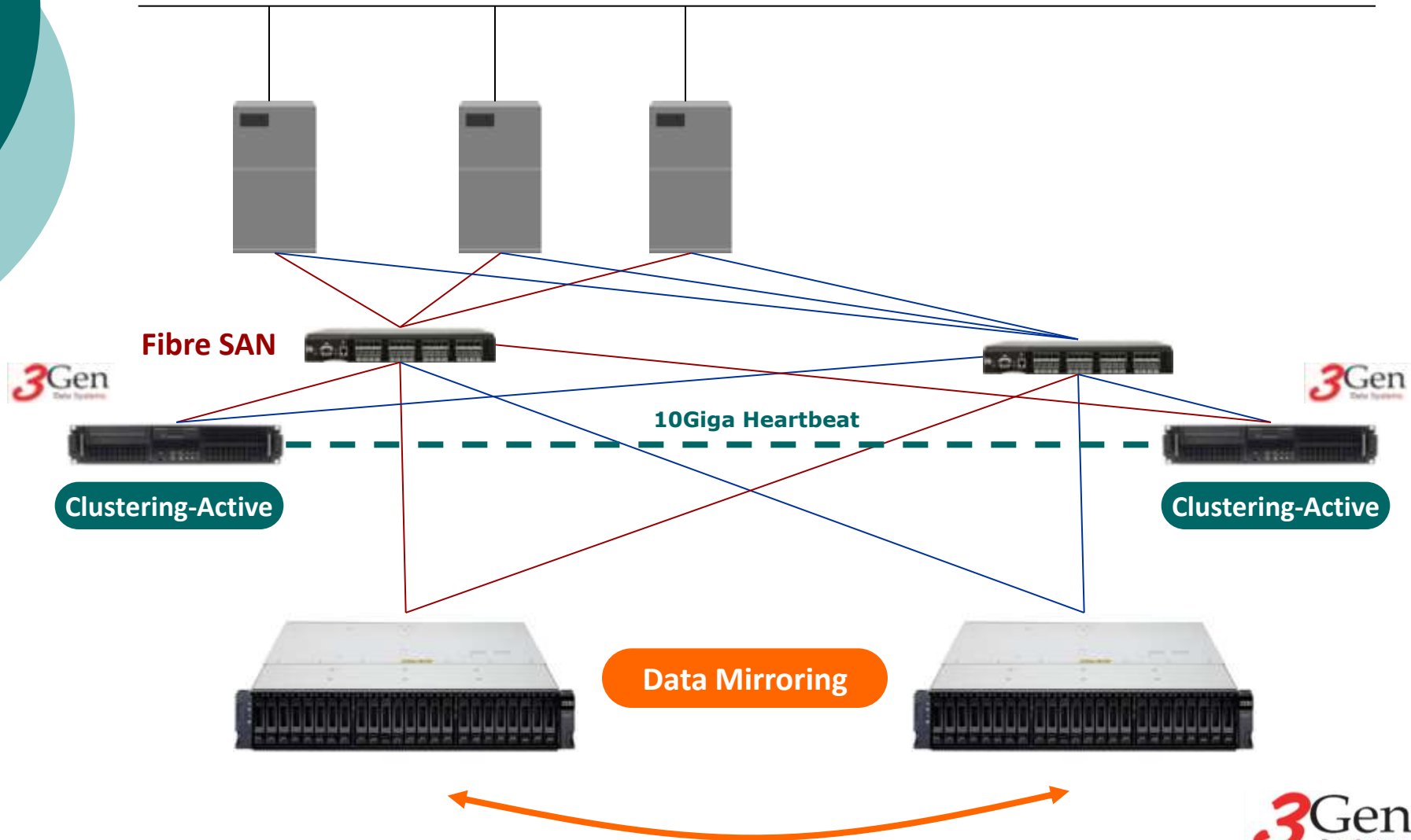
# 整合HP,EMC儲存設備,達成HA 機制

LAN

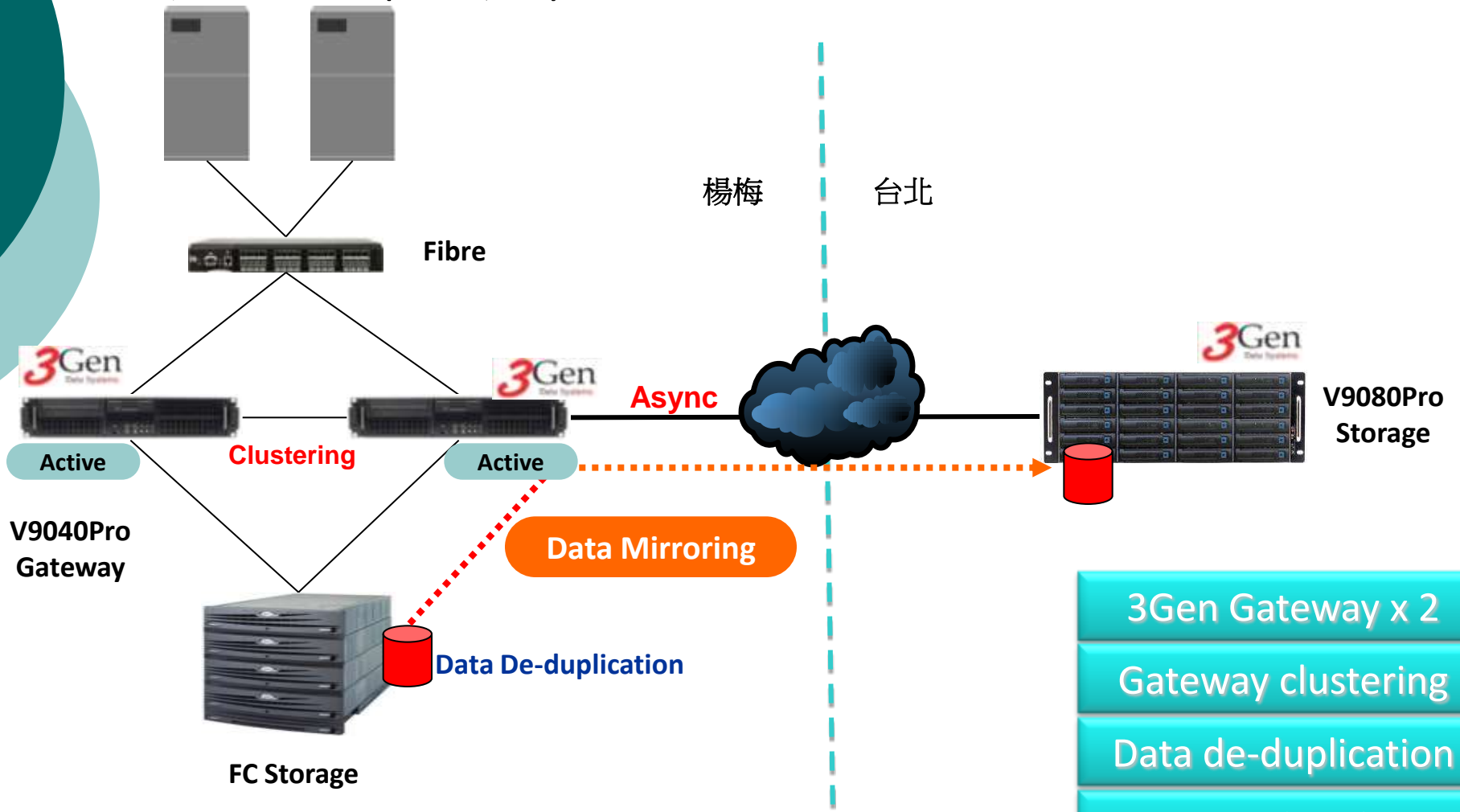


# Storage Gateway(Active-Active)建置Storage HA 機制

LAN



# Gateway clustering & Data mirroring – 整合Netapp Storage 異地資料備份 (規劃中)



建置兩台3Gen Gateway (Active-to-Active),將資料作Data De-duplication,縮小儲存容量  
透過3Gen Gateway 以Data Mirroring功能,將資料非同步方式傳輸至異地端之儲存設備

- 3Gen Gateway x 2
- Gateway clustering
- Data de-duplication
- Data Mirroring
- 3Gen V9080Pro

# Questions?

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