

# READY FOR ANY vForum2015

9 December 2015 | Taipei, Taiwan

## 駕馭多核運算力，儲存效能再進化

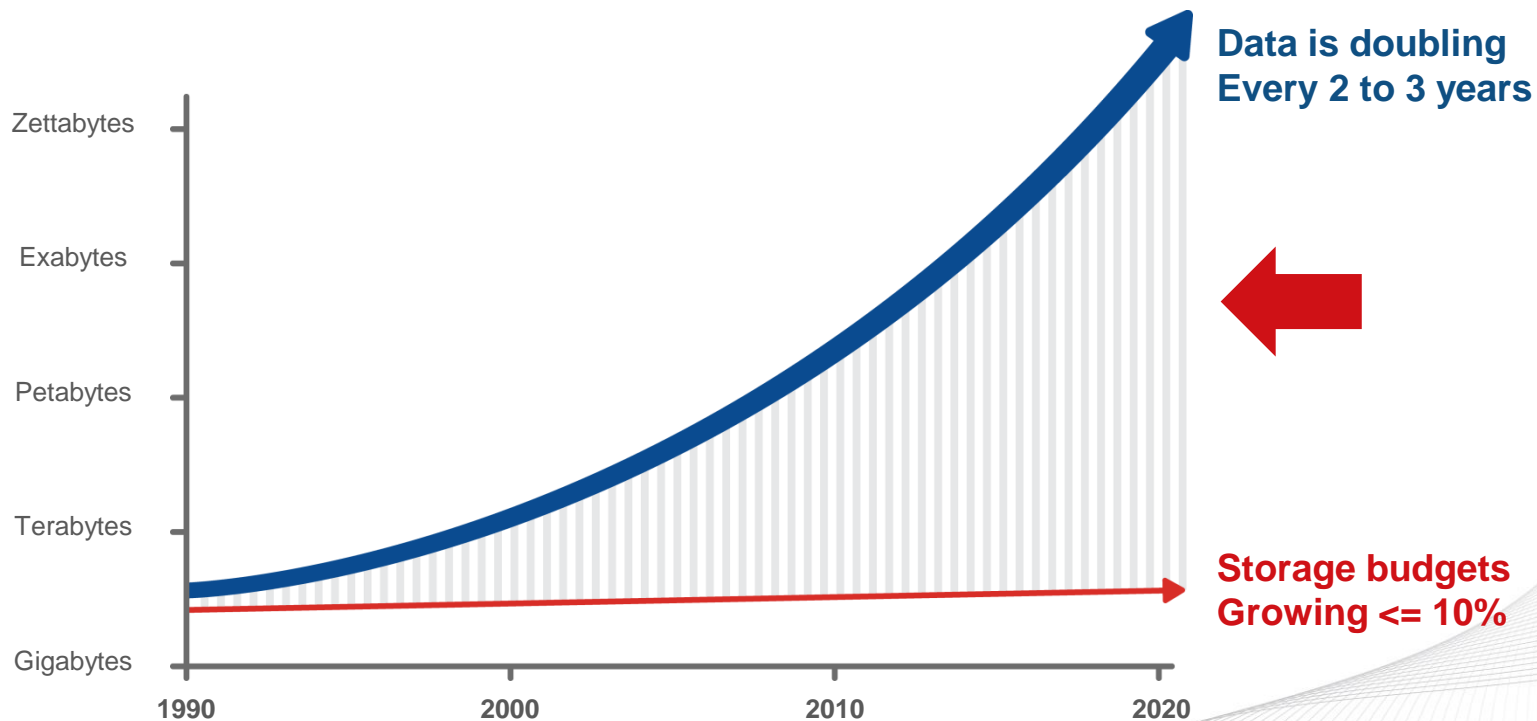
楊建國

大中華區資深技術顧問

# Topic

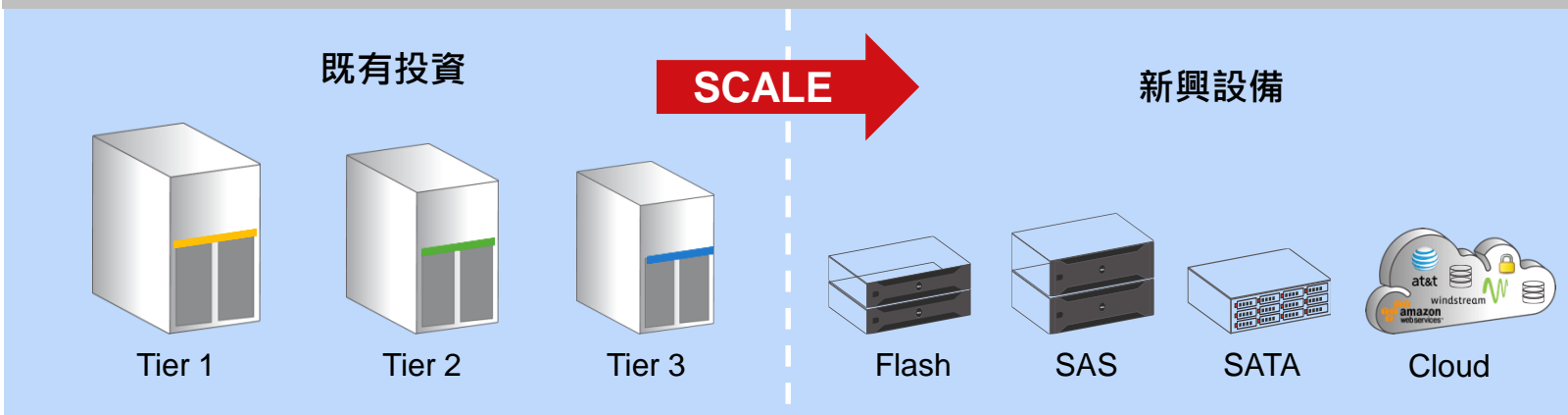
- Real Software Defined Storage
- DataCore Hyper-Converged
- Support VMware VVOL

# 儲存需求永不停歇



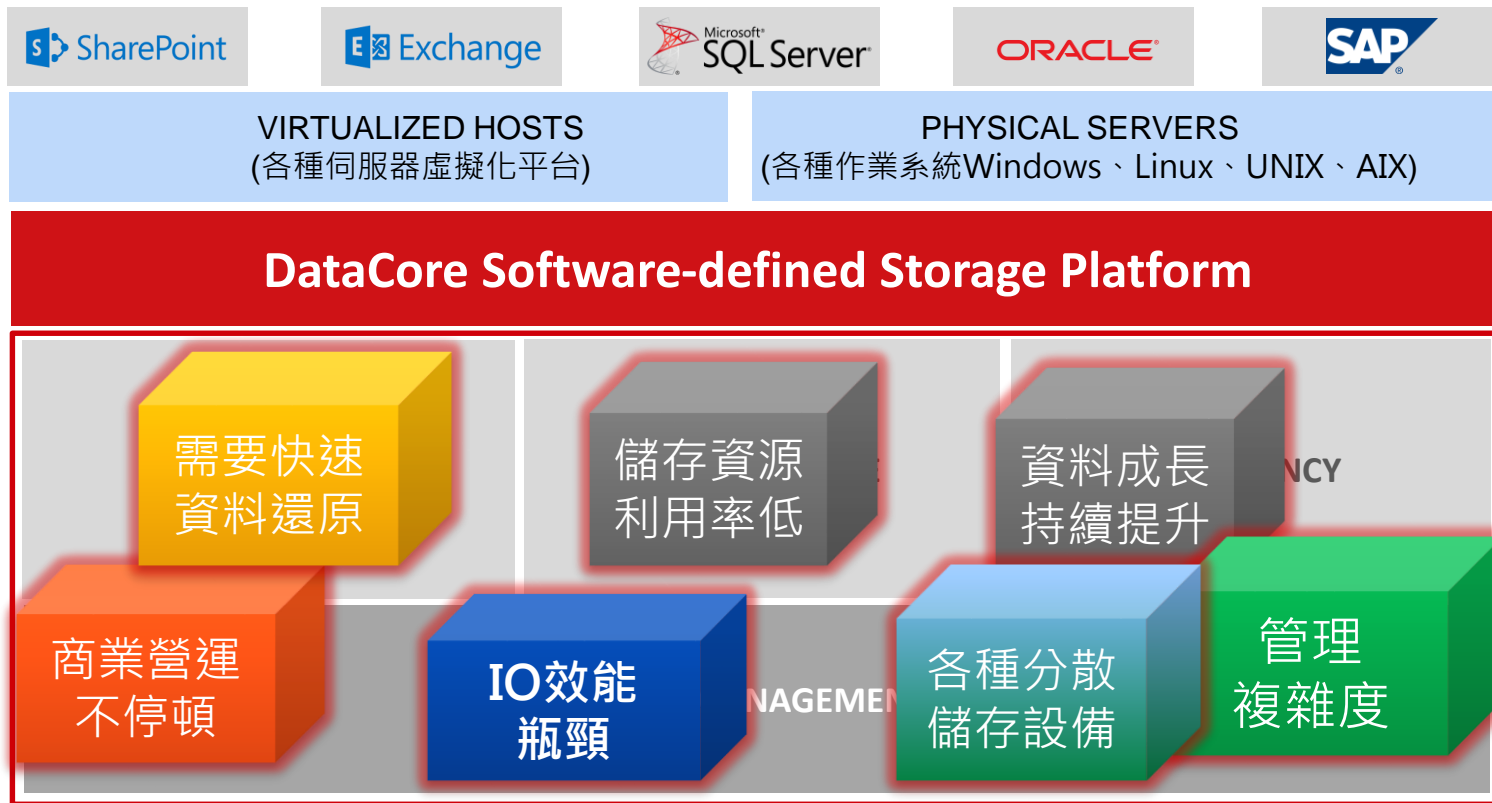
# 我們需要更聰明簡約的擴充方案

EASILY MIGRATE DATA, ADD PERFORMANCE, CAPACITY



跨異質儲存達成 --- 自動分層、異地複製、鏡像、快照、CDP

# 來自IT Infra的各種挑戰與需求



# 廣泛的應用服務與資料保護支援

SharePoint

Exchange

Microsoft  
SQL Server

ORACLE





SAP

VIRTUALIZED HOSTS  
(各種伺服器虛擬化平台)





PHYSICAL SERVERS  
(各種作業系統Windows、Linux、UNIX、AIX)

## DataCore Software-defined Storage Platform





### AVAILABILITY

-  Synchronous Mirroring
-  Asynchronous Replication
-  CDP
-  Snapshots / Backups




### PERFORMANCE

-  Caching
-  Auto-tiering
-  Random Write Accelerator
-  Quality of Service (QoS)

### EFFICIENCY

-  Storage Pooling
-  Thin Provisioning
-  Data Migration
-  Deduplication/Compression

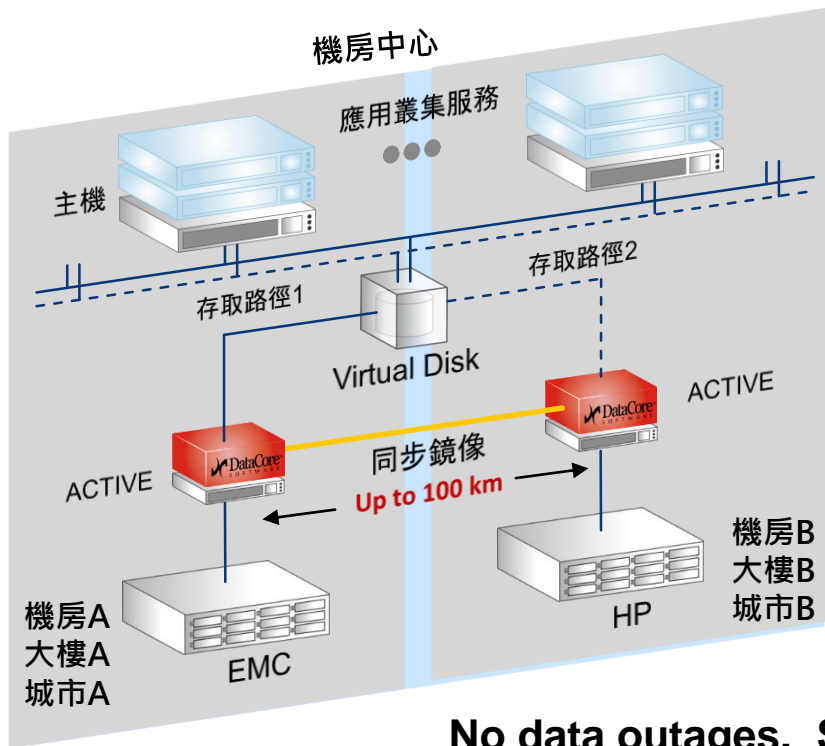
### UNIFY MANAGEMENT

-  NAS/SAN (Unified Storage)
-  Centralized Management
-  Cloud Integration
-  Analysis & Reporting

# 確保關鍵應用不中斷服務的彈性



**100%**  
reduction in  
storage-related  
downtime



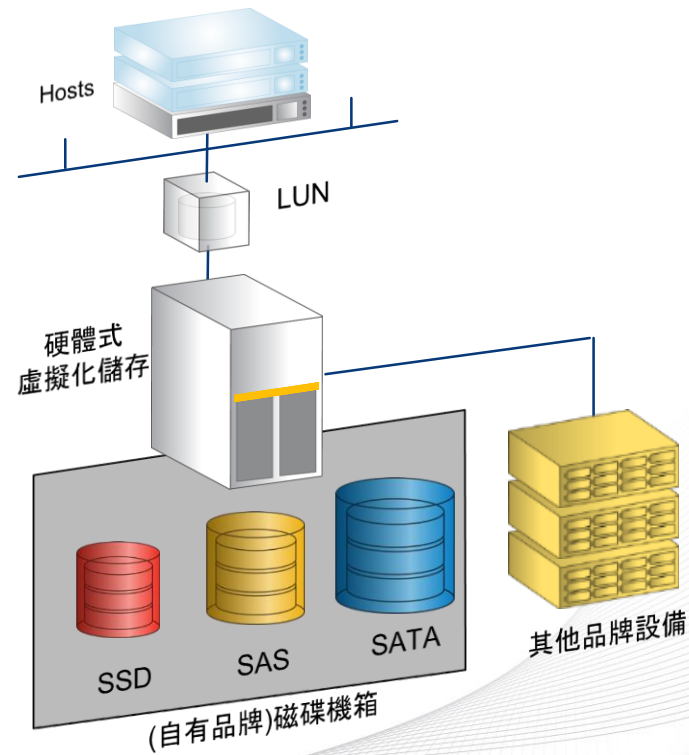
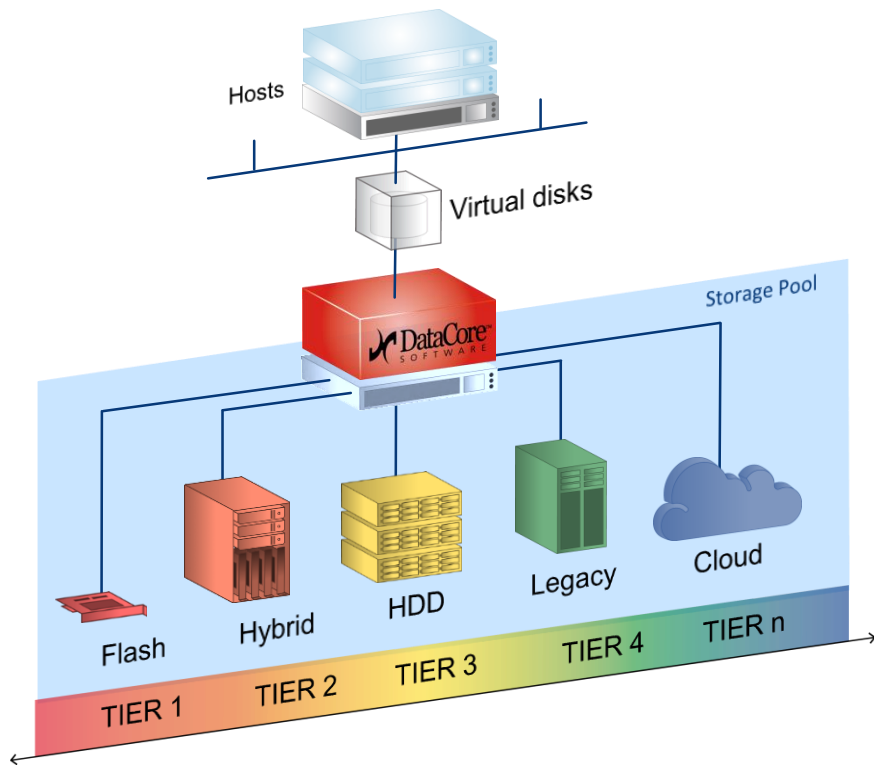
**No data outages. Same or different storage**

- 全自動切換機制(Failover & Failback)
  - ▶ 應用服務存取不中斷
- Metro Clustering
  - ▶ Grid技術(無複雜仲裁磁碟)
  - ▶ 建置快速
- 自行修復
- 不停機維護
  - ▶ 升級
  - ▶ 資料遷移

# 異質融合自動分層

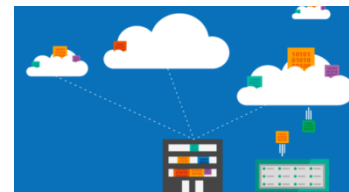
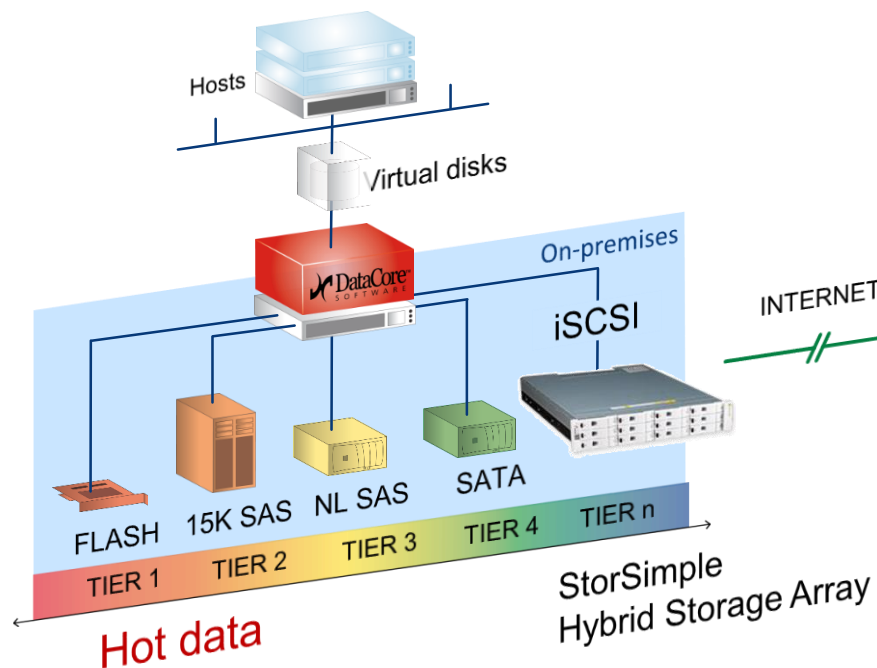
vs.

# 異質整合自動分層





# 混合雲：降低成本 & 簡化管理



- 備援到雲端
- 低成本的  
彈性雲儲存
- De-duped
- Compressed
- Replicated

# 何謂Parallel? (平行處理)

所有人(服務)都在等待

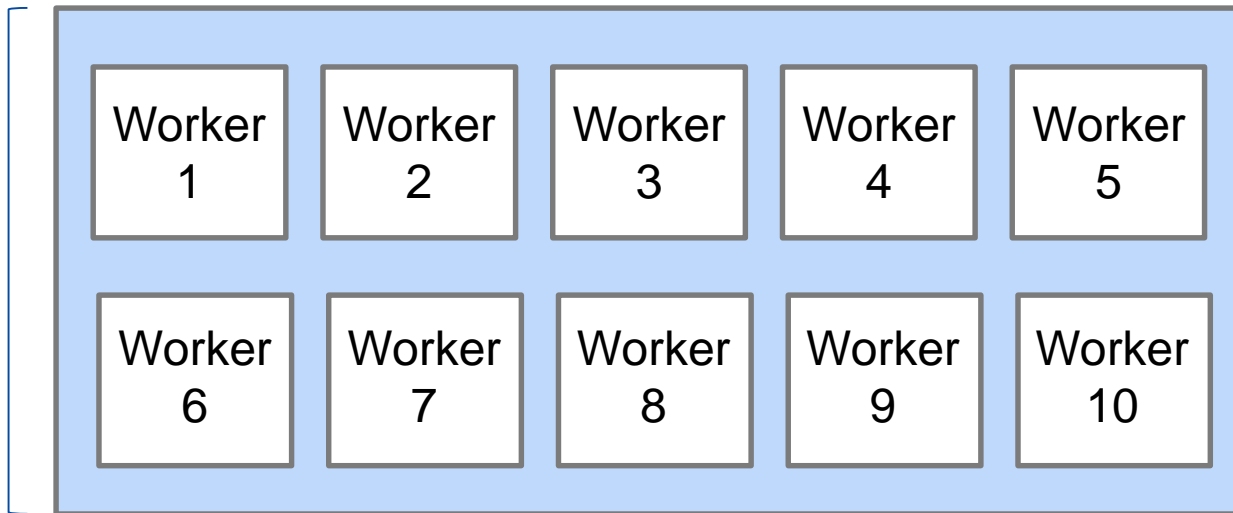
快速消化負載  
的機制



# 現代的多核心CPUs

多個“workers”能同時處理運算，網路，與I/O loads

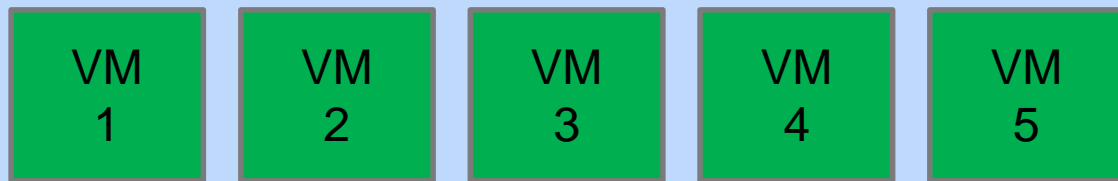
10-cores



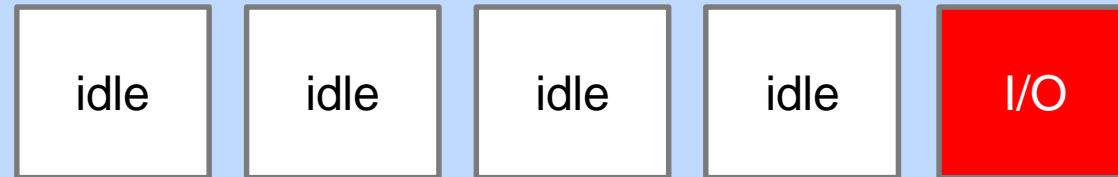
# 目前的虛擬化技術，如何駕馭多核心CPU?

VM = Virtual Machine

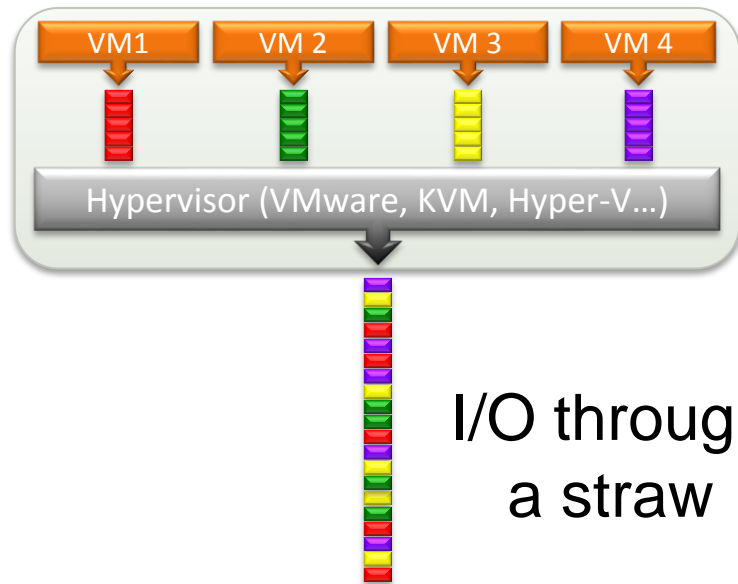
Parallel  
Compute



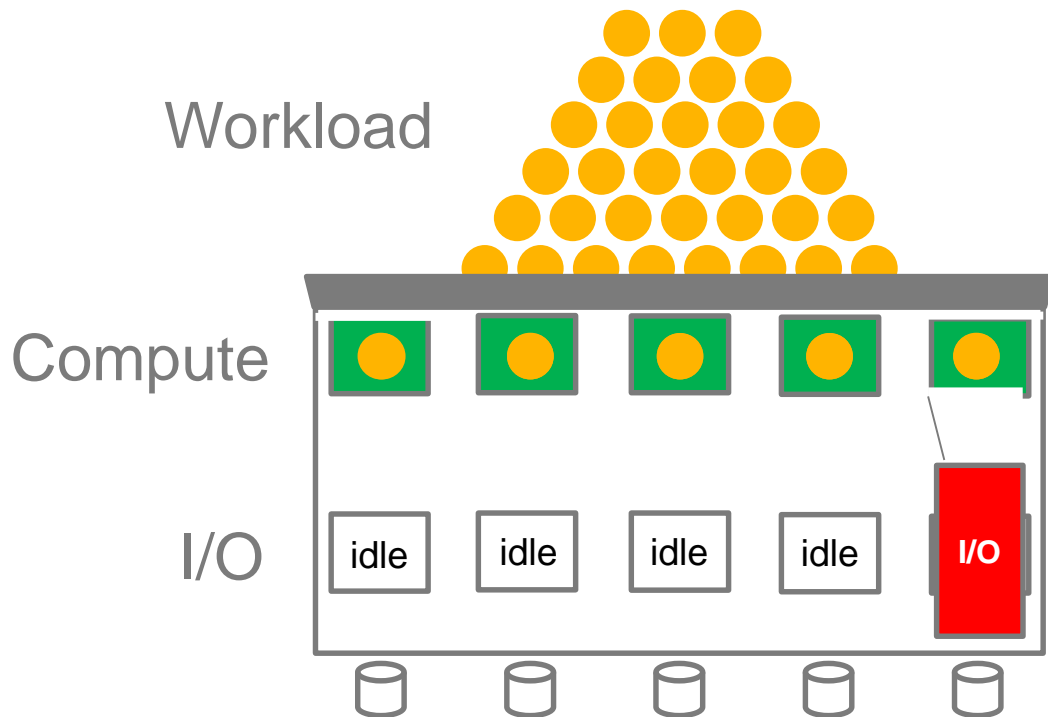
Serial I/O



# 混合的應用負載揭露了目前技術的I/O瓶頸

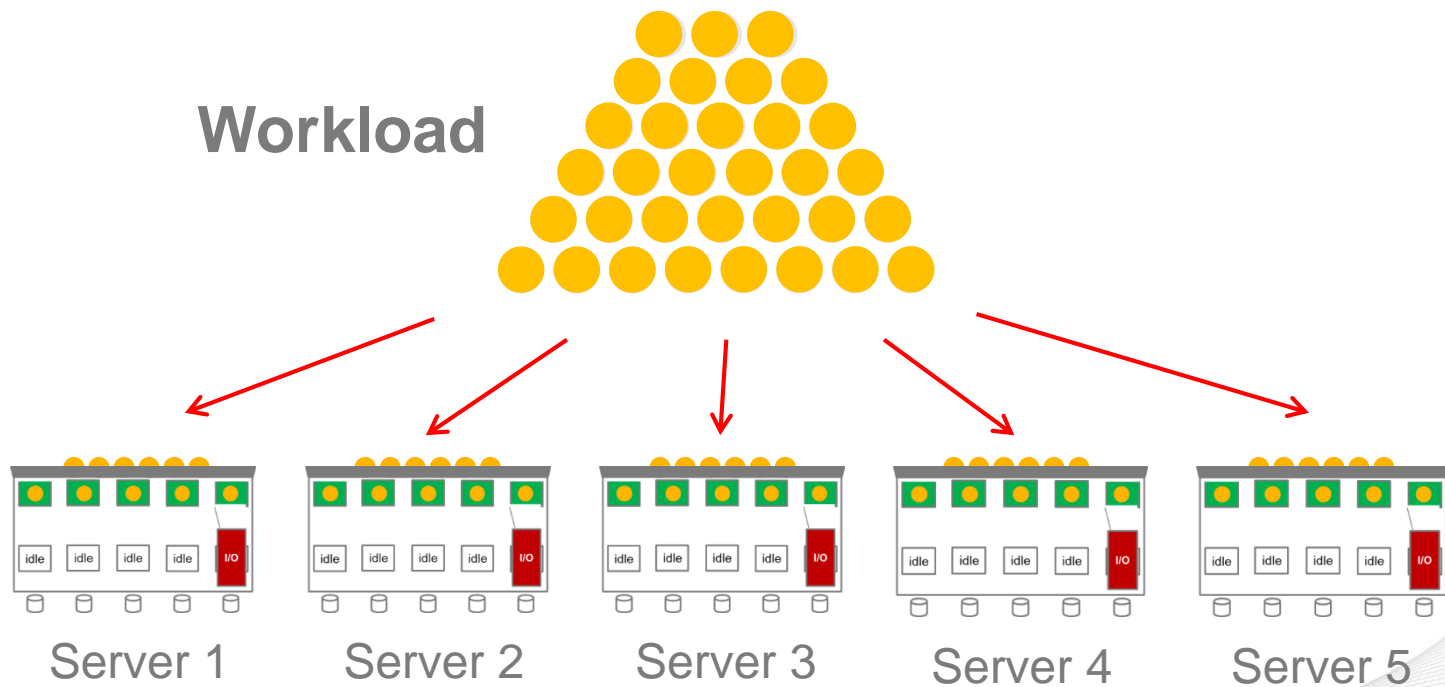


# 虛擬化平台中的Serial I/O技術瓶頸

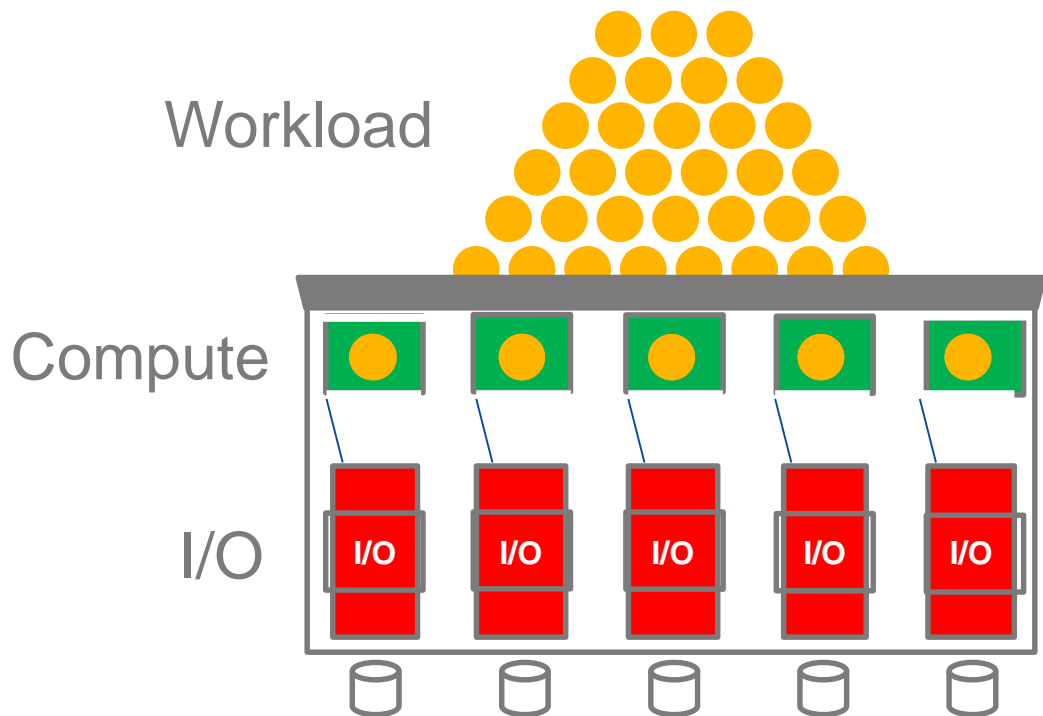


- 運算永遠在等著 I/O
- 多核心CPU 資源的浪費

# Impact: 越來越多的負載，需要分散I/O



# DataCore Parallel I/O 渦輪加速

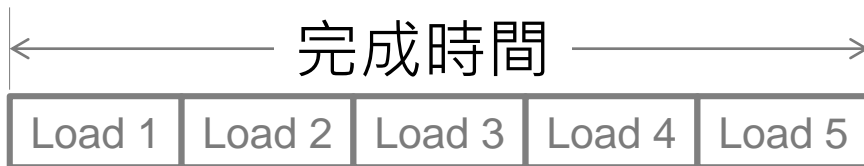


- DataCore專有polling技術
- 可完全駕馭CPU多核心運算力
- 短時間完成工作

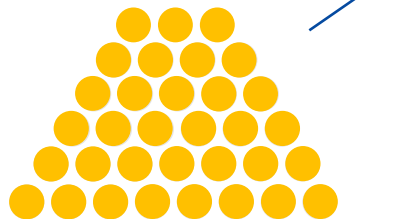


# Serial vs. Parallel Processing

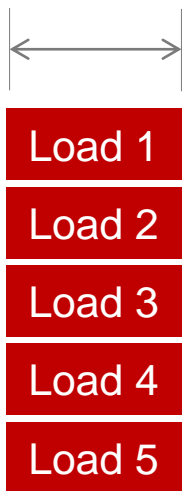
1  
worker  
(Serial)



一堆工作



5  
workers  
(Parallel)



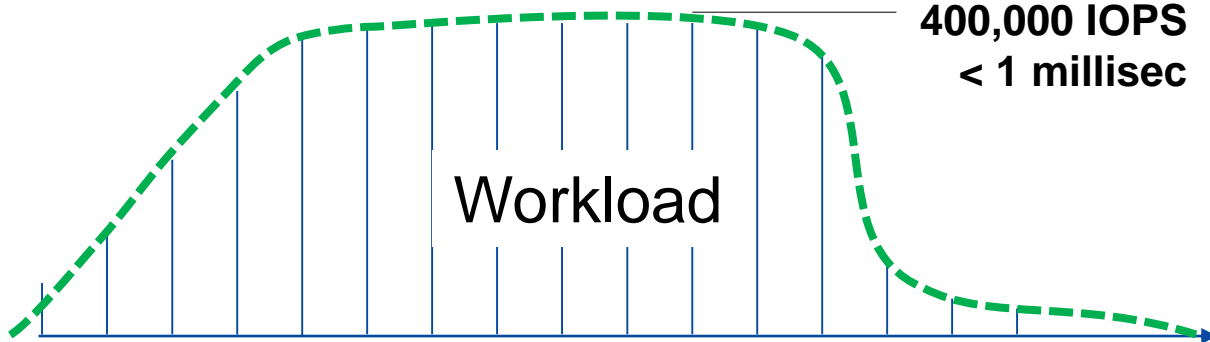
# 動態Parallel I/O技術

```

interval      i/o      MB/sec      bytes      read
1000**2      i/o      pct
11:04:47.274 Slave synch      complete
11:04:47.274 Workload ge      started
11:04:47.274 Starting RP      BSU rate: 8000; Elaps
-----
11:07:49.203      3      399994.25      3281.74      8204      39.43      0.668
C:\BenchmarkRun>
    
```

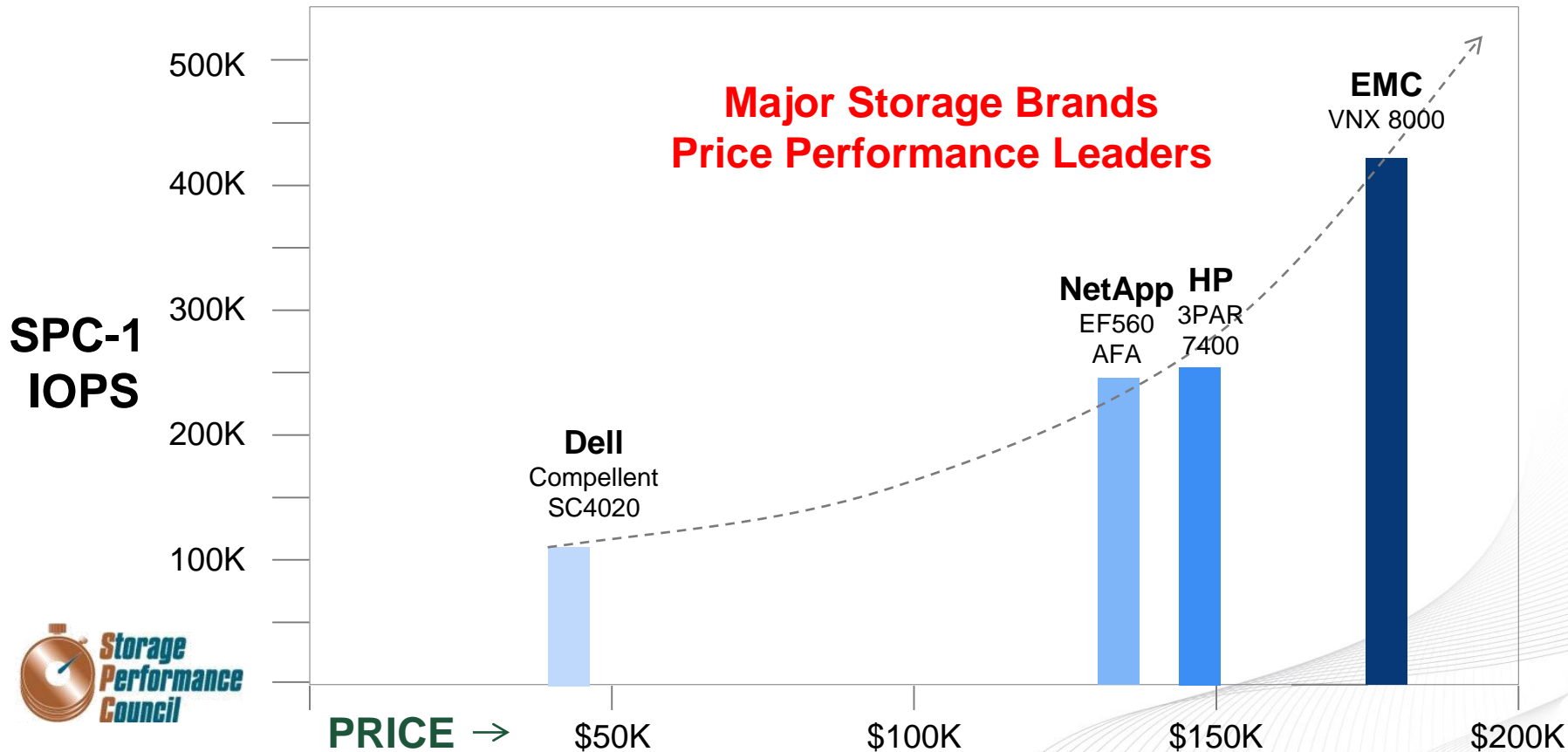
IOPS

Response Time (millisec)

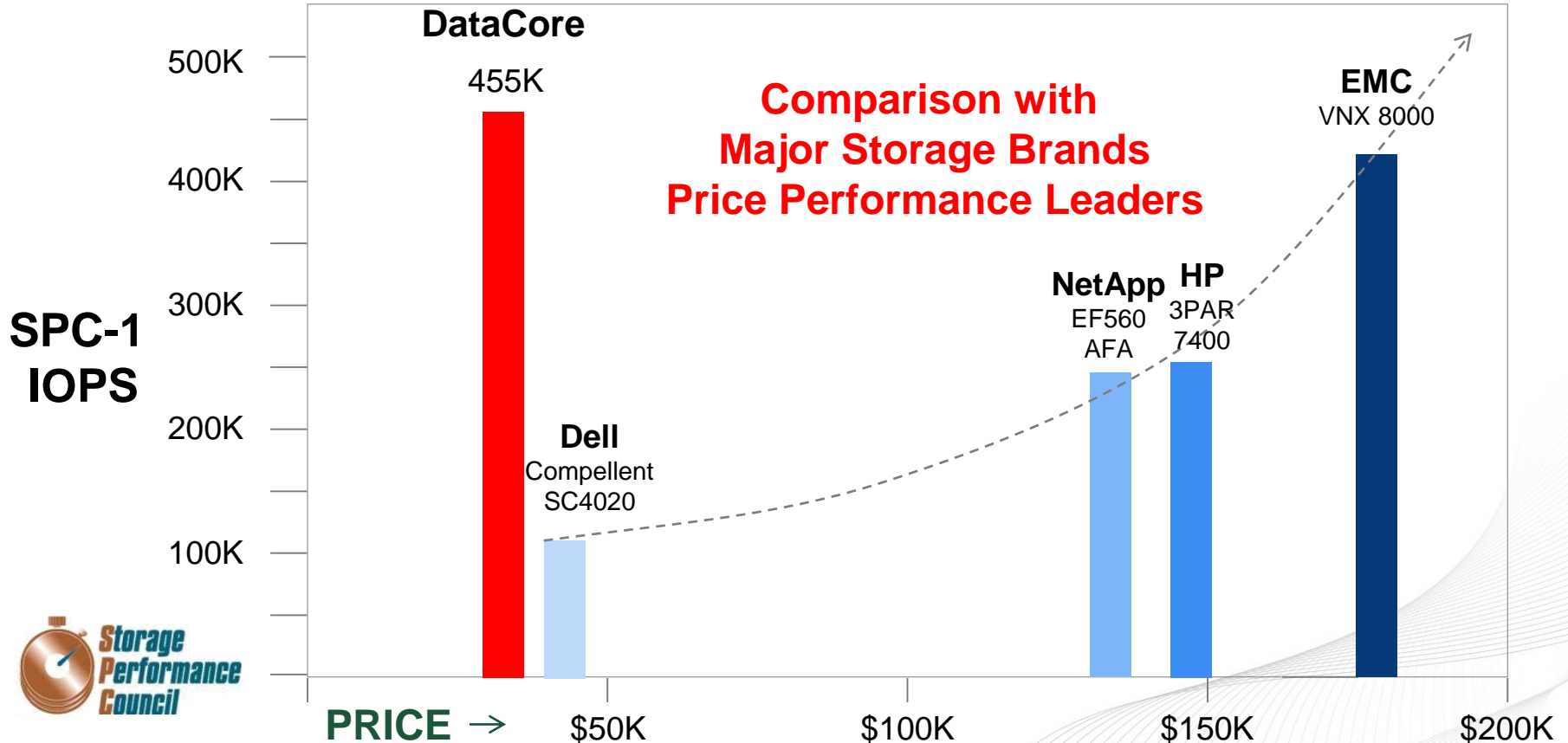


Utilization	Speed	Maximum speed:	2.30 GHz
12%	1.63 GHz	Sockets:	2
Processes	Threads	Cores:	36
394	20273	Logical processors:	72
Up time	Handles	Virtualization:	Enabled
0:18:10:57	360121	L1 cache:	2.3 MB
		L2 cache:	9.0 MB
		L3 cache:	90.0 MB

# Price & Performance on SPC-1



# Price & Performance on SPC-1



## SPC-1 Results - "Top Ten" by Price-Performance

Each company logo is a link to the company's best SPC-1 Result by price-performance



(updated: 30 November 2015)

Rank, Price-Performance (\$/SPC-1 IOPS) Test Sponsor	SPC-1 Submission Identifier - Tested Storage Product (TSP)	SPC-1, SPC-1/E Version	Peer Review Status Storage Device Category (all listed Results are Active)	Documentation, Submission Date, and Revision Status	
<b>#1, \$0.08</b> <a href="#">DataCore Software Corporation</a>	A00164 <a href="#">DataCore SANsymphony-V 10.0</a>	v1.14	<b>Submitted for Review</b> HDD and SSD Storage Devices	<a href="#">Executive Summary</a> <a href="#">Full Disclosure Report</a> <b>Submitted:</b> 30 November 2015	No Revisions
<b>#2, \$0.24</b> <a href="#">Infortrend Technology, Inc.</a>	A00158 <a href="#">Infortrend EonStor DS 3024B</a>	v1.14	<b>Accepted:</b> 11 August 2015 SSD Storage Devices	<a href="#">Executive Summary</a> <a href="#">Full Disclosure Report</a> <b>Submitted:</b> 12 June 2015	No Revisions
<b>#3, \$0.32</b> <a href="#">X-IO Technologies</a>	A00155 <a href="#">X-IO ISE 820 G3 All Flash Array</a>	v1.14	<b>Accepted:</b> 9 May 2015 SSD storage devices	<a href="#">Executive Summary</a> <a href="#">Full Disclosure Report</a> <b>Submitted:</b> 10 March 2015	No Revisions

# DataCore Hyper-Converged solution

透過Parallel I/O技術的協助，DataCore超融合架構適用於

## ■ 低延遲的虛擬應用服務

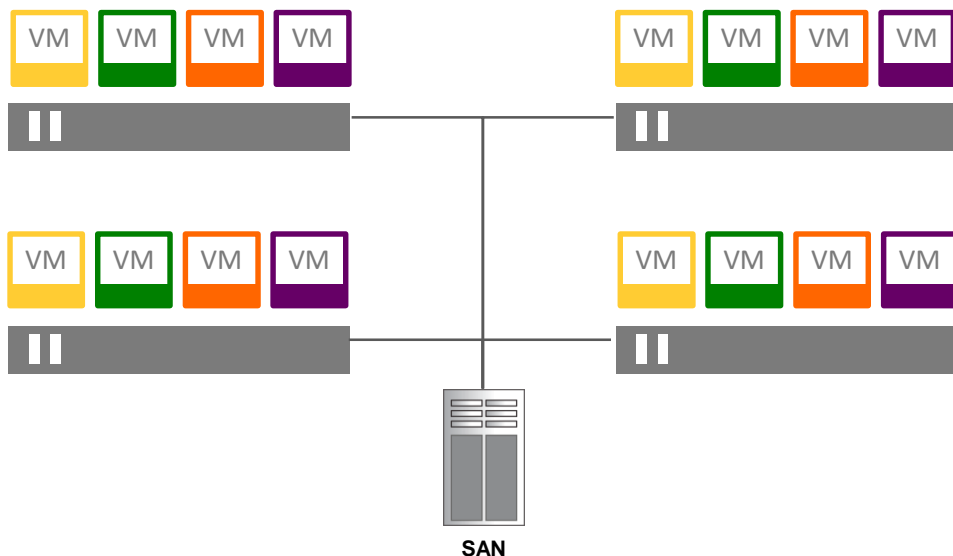
- ▶ Databases (MS SQL Server, ...)
- ▶ Apps based on databases (MS Exchange, MS SharePoint, ...)
- ▶ VDI (Citrix XenDesktop, VMware Horizon)



## ■ Remote Office / Branch Office (ROBO)

- ▶ 餐廳、飯店、零售、製造業、分支機構、醫療機構、銀行分部等等

# 常見的虛擬化架構



VDI

Database

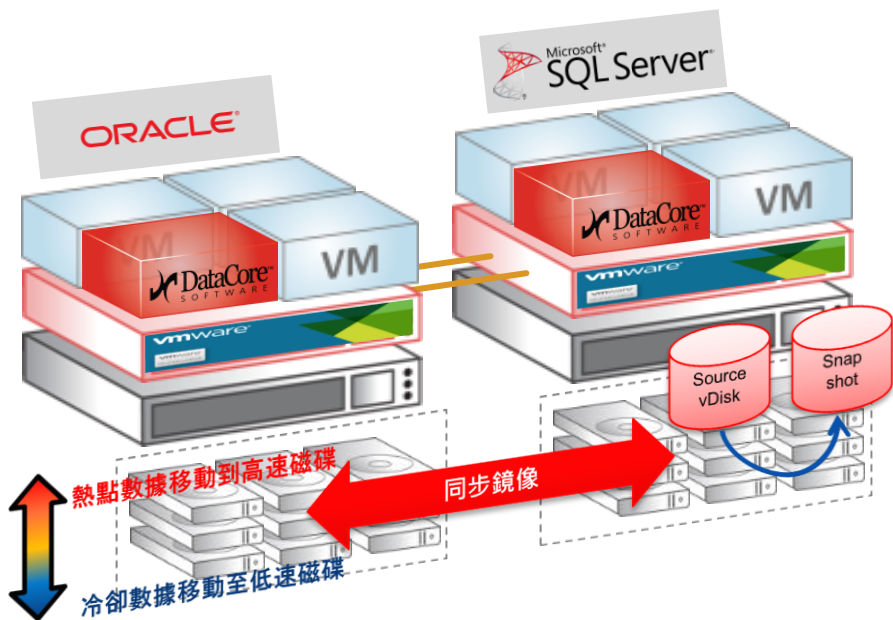
DB App

General

## 挑戰

- 來自不同應用服務的壓力造成的混合性負載
- 無法擴展 I/O 效能
- 儲存設備通常是單點錯誤

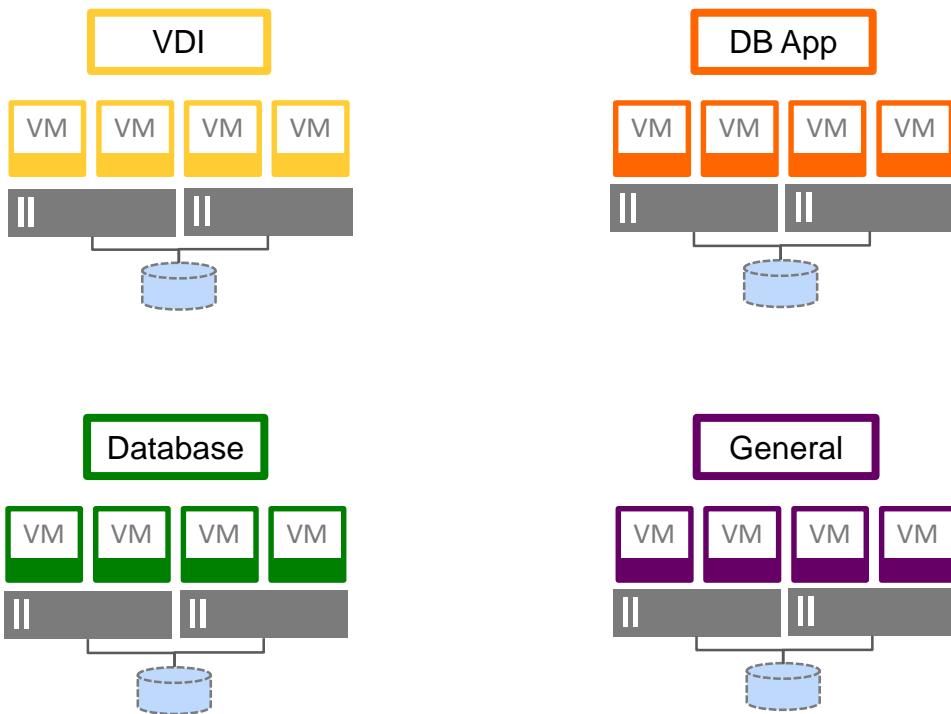
# DataCore超融合架構



- Cost down
  - 無共享儲存設備需求
  - 實體伺服器需求最低 **"2"**
- 資料保護
  - 內建Storage HA
  - 全自動I/O切換
  - 完整儲存保護技術
    - Snapshot/CDP/Replication
- 儲存加速
  - 高速大容量快取
  - Parallel I/O技術
  - 儲存自動分層



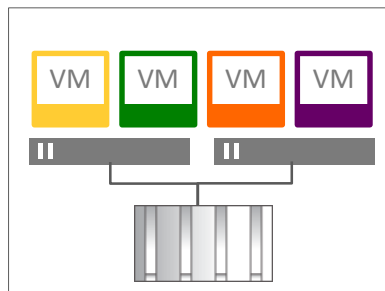
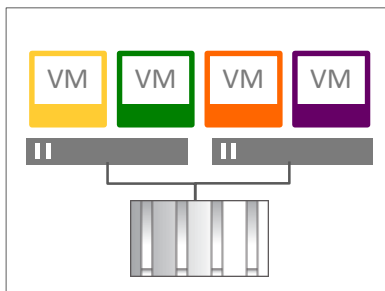
# 虛擬化叢集應用 + DataCore超融合



## Solution

- 提供所需的IO給需要關鍵性的叢集應用
- 儲存層最接近應用服務端
- 應用服務得到多重保護

# 分支機構(ROBO)的虛擬化架構

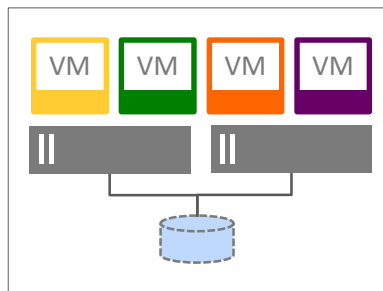
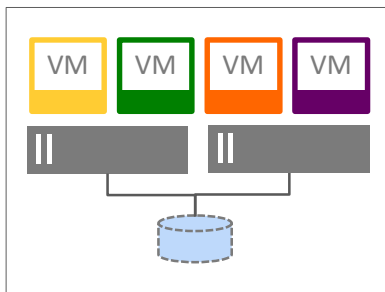


## Challenges

- 需要保持低建置成本
- 可靠度一直是IT人員的挑戰
- 通常都採用低階儲存，但有單點錯誤的問題

ROBO : Remote Office /Branch Office

# 採用DataCore超融合架構的ROBO



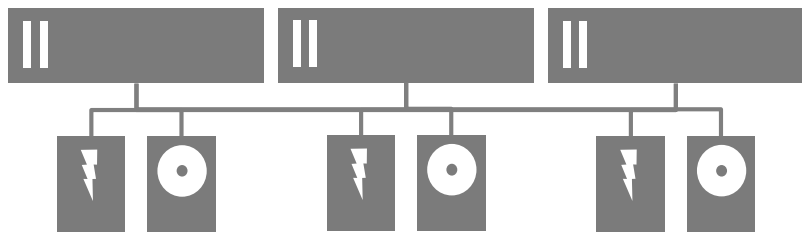
## Solution

- 使用伺服器內部硬碟降低成本
- 高可靠/高可用技術，無單點錯誤

ROBO : Remote Office /Branch Office

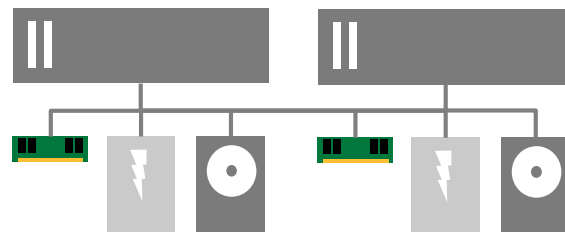
# 效能：Flash vs RAM for I/O Acceleration

其他超融合方案



- Always need Flash/SSD for performance
- More nodes more IO performance

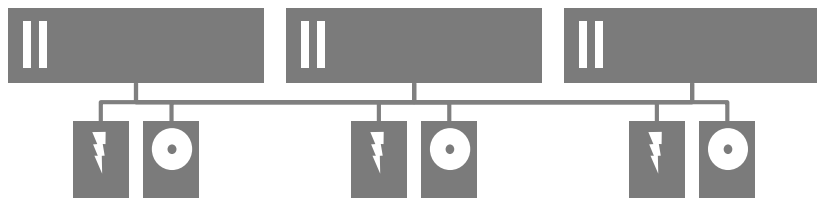
DataCore 超融合



更佳的儲存效能 : RAM 10倍快於Flash  
業界獨家IO處理技術: Parallel I/O技術  
更低的硬體成本 : Flash 是選項

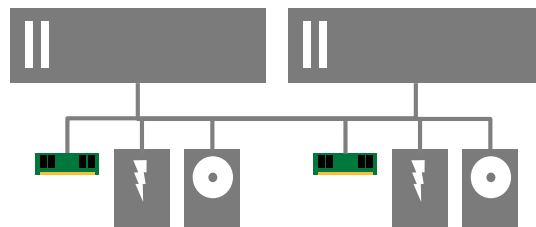
# 高可用 : 3 vs 2 nodes

## 其他超融合方案



**3個節點起跳**  
**(實際建議4個節點)**

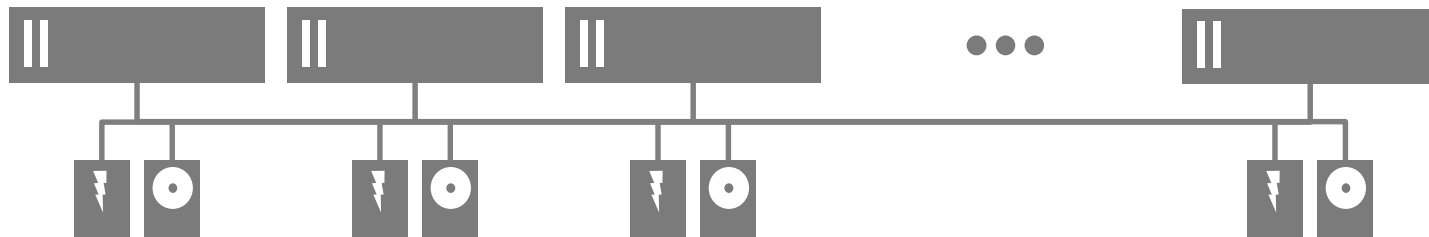
## DataCore 超融合



**最低硬體投資成本**

# 延展擴充： Add Nodes (compute & storage)

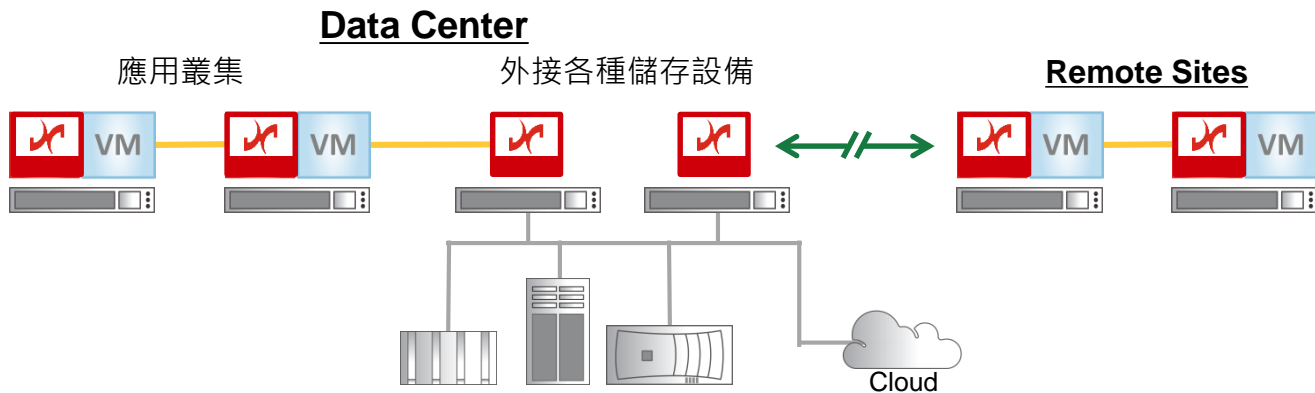
其他超融合方案











# DataCore

## 無接縫的儲存擴充自由度

### DataCore Software-defined Storage Platform



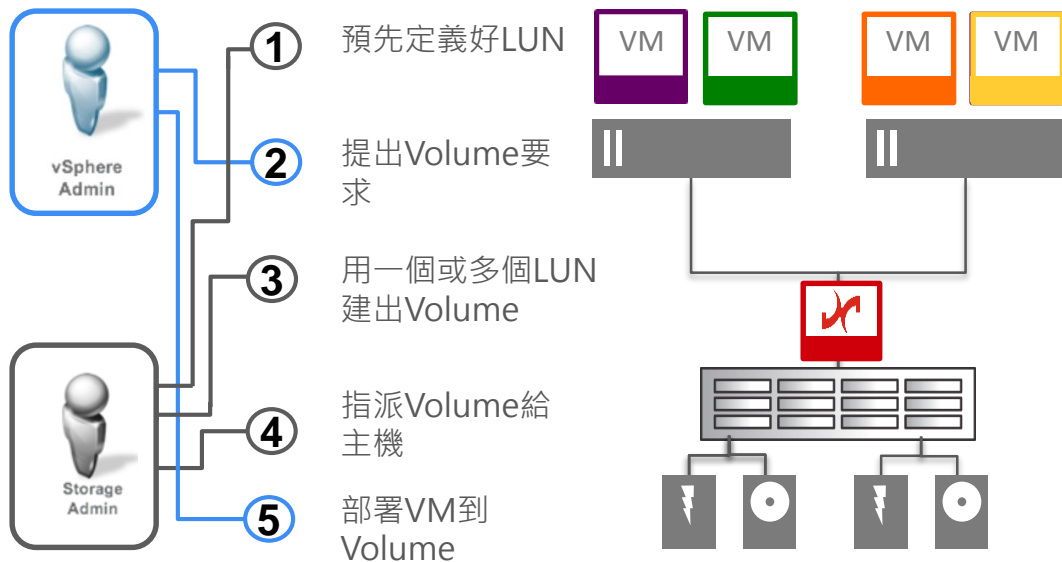
# DataCore超融合方案的優勢

Key Criteria	DataCore Virtual SAN
RAM for I/O Acceleration	
2 nodes for High Availability	
2 nodes for Stretch Cluster	
Scale out storage capacity independent of compute	
One management platform across storage infrastructure	
One set of services across all storage devices	
Support for Multi-hypervisor & Non-virtual environments	
Hardware independent	



# vSphere 管理員的困惱

## 虛擬機與儲存管理不同調

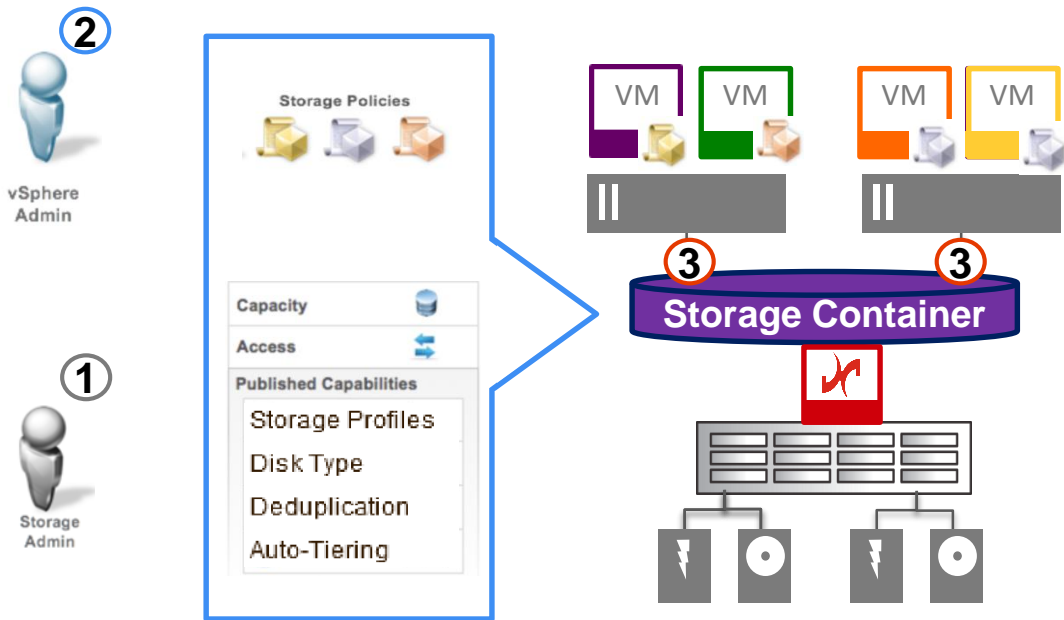


## Challenge

- **Slow provisioning**
  - ▶ vSphere 管理員無法窺見儲存全貌
  - ▶ 部署虛擬機的複雜度，常需要與儲存管理員互動
- **Management**
  - ▶ 儲存管理員需要持續記錄所有的LUN Mapping

# VVols: 運作方式

## 基於虛擬機與儲存的政策性部署與管理



### ① Storage admin:

- ▶ 以建立儲存容器方式取代給予不同的volume

### ② vSphere admin:

- ▶ 定義政策 – 例如. 金、銀、銅
- ▶ 用這些政策來部署新的虛擬機到適當的儲存體

### ③ vSphere storage (VASA) API 連接新虛擬機到儲存體

# VVols讓部署VM變得容易

## VM & volume provisioning is unified



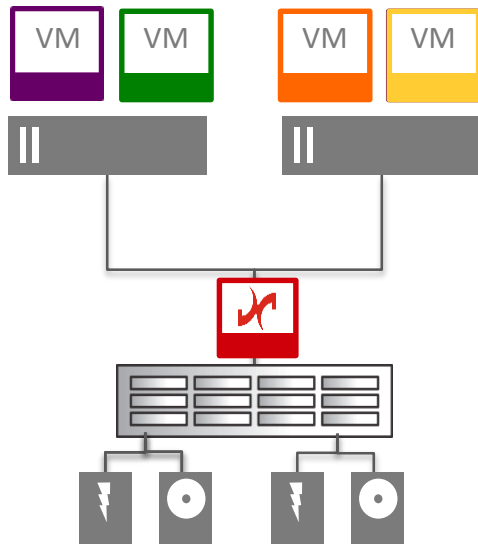
vSphere  
Admin

依照虛擬機需求部署在適當效能的儲存上



Storage  
Admin

節省更多時間在溝通部署程序上



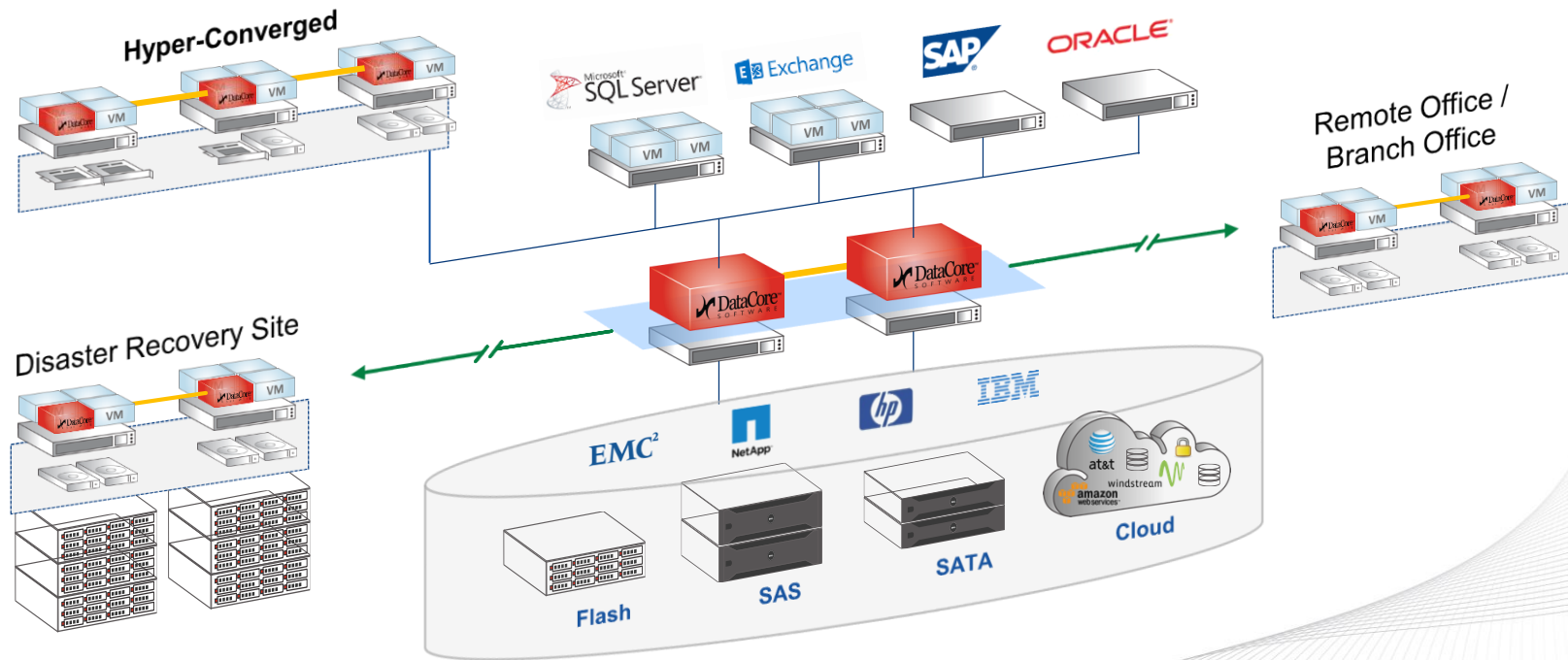
## ■ VVols benefit

- ▶ 虛擬機部署更流暢
  - 政策導向的部署方式
  - 不需要常麻煩儲存管理員
- ▶ 簡化管理
  - 儲存管理者不需要紀錄一大堆的mapping

# VVols: Benefits with DataCore

	vSphere with VVols	vSphere with DataCore & VVols
Set storage policies for LUN	Yes	Yes
Set performance policy for the VMs	Yes	Yes
Per VM snapshot	Yes	Yes
Per VM clone	Yes	Yes
Supported on current storage	X	Yes
VVols support to non-VVols certified storage	X	Yes

# 完整的資料保護+最佳Cost Performance



# 以少勝多

## ■ More

- ✓ 最快的系統回應速度
- ✓ 最廣泛的平台支援與資料保護
- ✓ 最佳TCO

**Any Hypervisor,**  
**Any Application,**  
**Any Server & Storage**

## ■ Less

- ▶ 最少的硬體需求
- ▶ 最少ROI
- ▶ 無硬體包袱



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FOR **ANY**  
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