架構大數據儲存平台
挖掘物聯網資料真價值

EMC ISILON PRESALES 技術顧問:
簡君芳 FRANCES CHIEN

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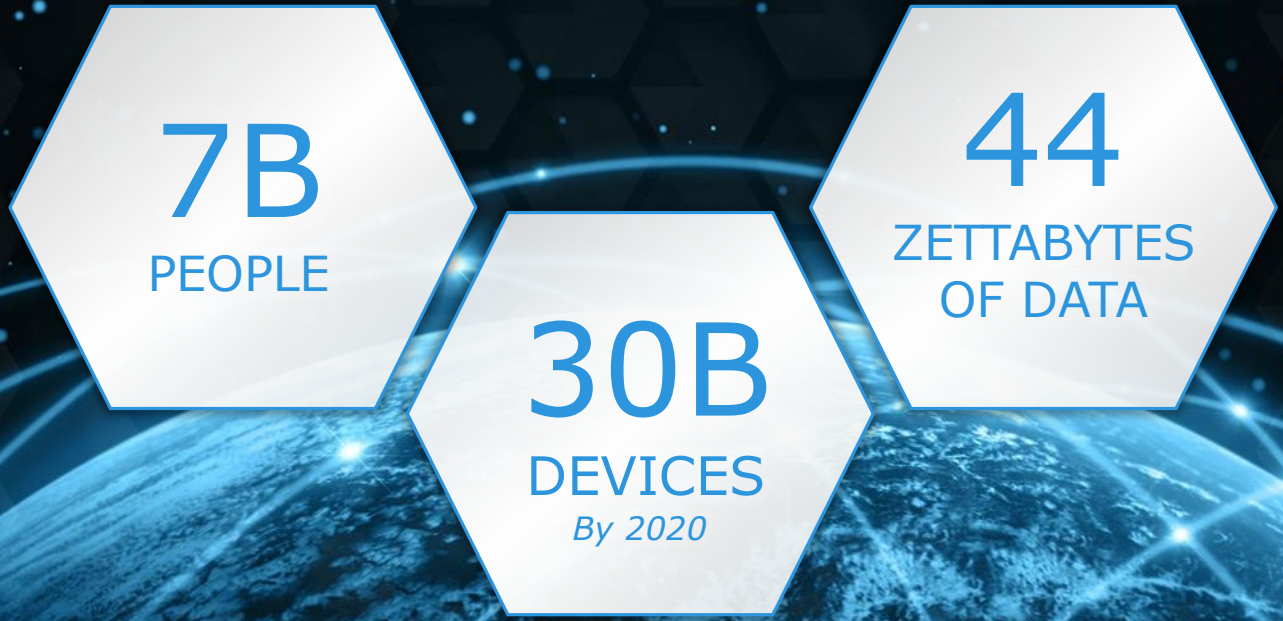
…With IoT You Can



SOURCE: GARTNER GROUP, 2014/2015

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IoT is disrupting Industries

Manufacturing	**S**mart **factories**, **process control**, **supply/labor efficiency**, and **automation control**
Retail	**"just-in-time" management, promotions**, and **Location-based advertising**
Energy	S**mart meters** and **grids**, **preventative maintenance,** and **environmental monitoring**
Transportation/ Infrastructure	S**mart infrastructure**, **traffic optimization**, **maintenance**, and **fleet tracking**
Consumer	**Wearables**, **automotive**, **smart home**, and **entertainment** disruptions
Healthcare	**Hospital patient monitoring**, **home healthcare**, and **remote diagnosis**

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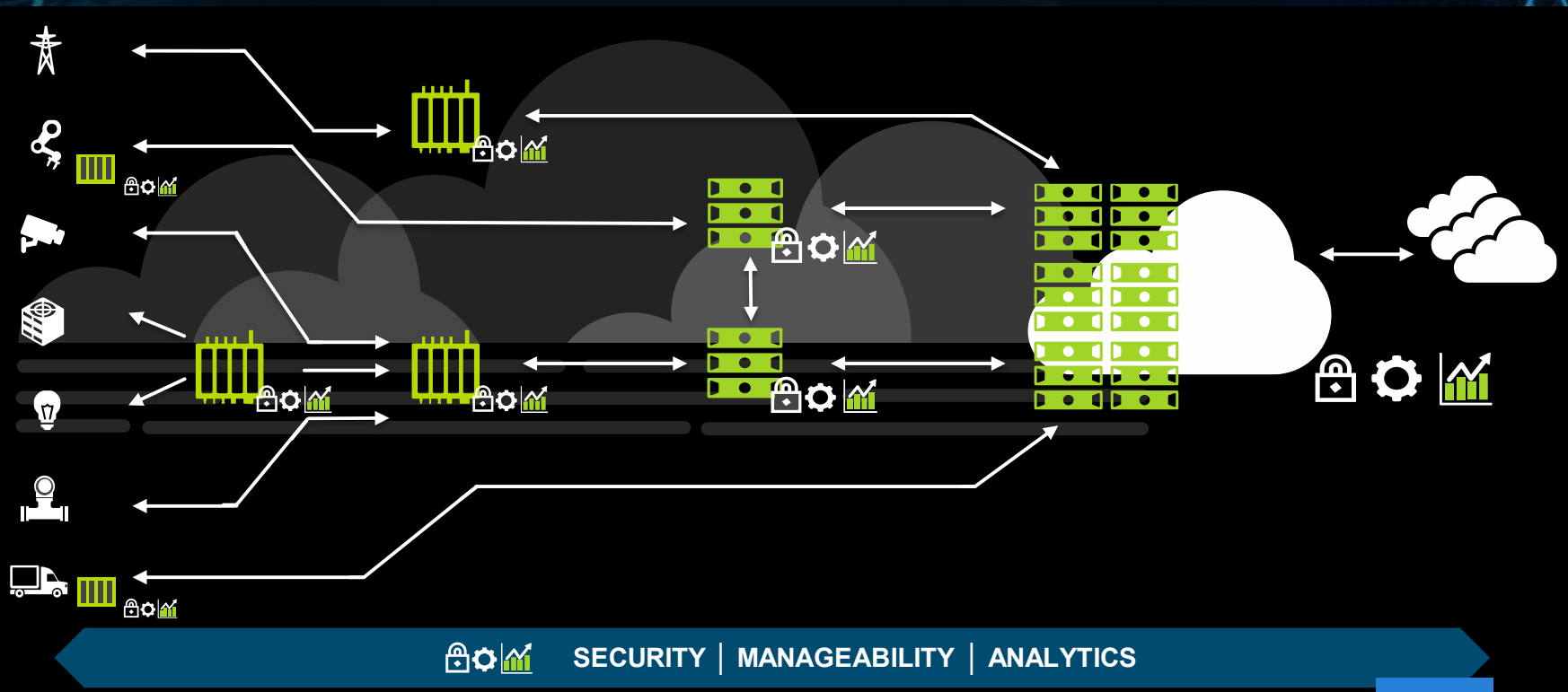
The IoT requires architecting from Edge to Core to Cloud



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The correlation of IoT, Big Data and even AI

"大數據、物聯網與人工智慧本質都指同一件事。物聯網強調「觸動器與感測器」，人工智慧強調「分析與決策」（分析依賴人工智慧，但決策還是操之在人），串流其中的是「數據」。以河川防洪為例，先有水位感測器蒐集數據，而人工智慧根據數據提出分析報告，人類依據報告做出防洪決策，啟動觸動器如水閘門做出改變，完成一個系統迴圈。"

By 微軟全球資深副總裁與亞太研發集團主席兼亞洲研究院院長洪小文

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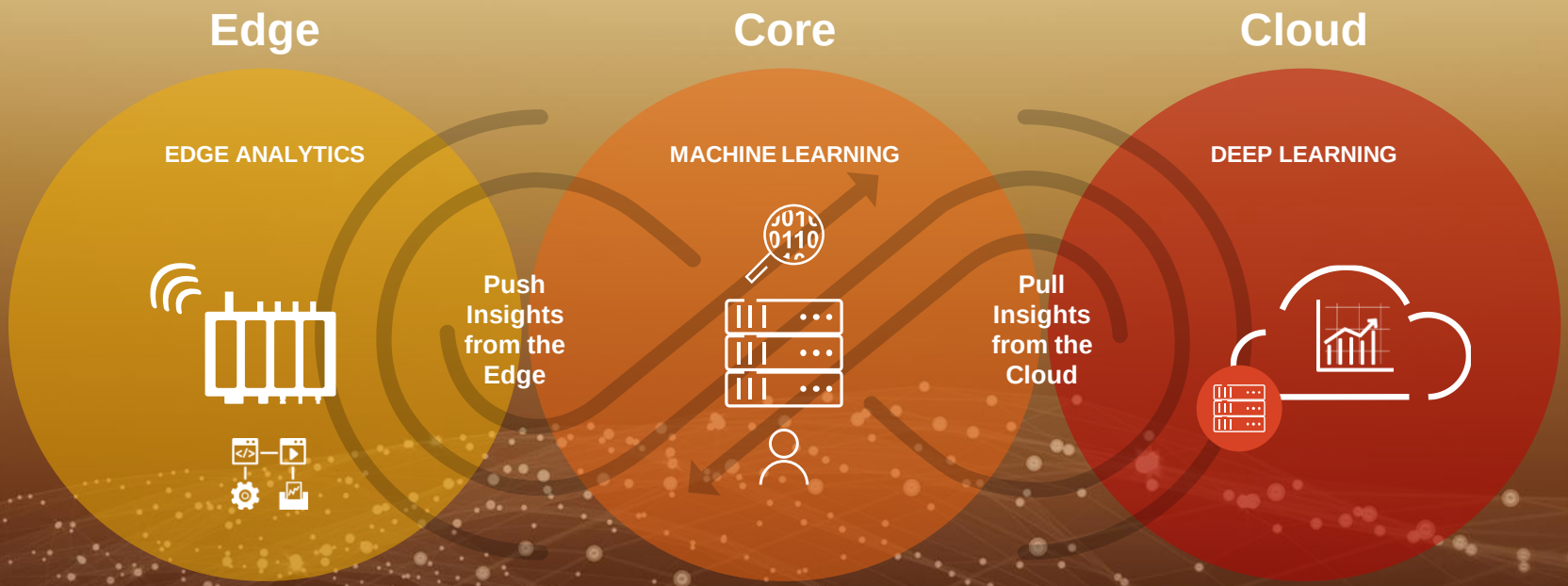
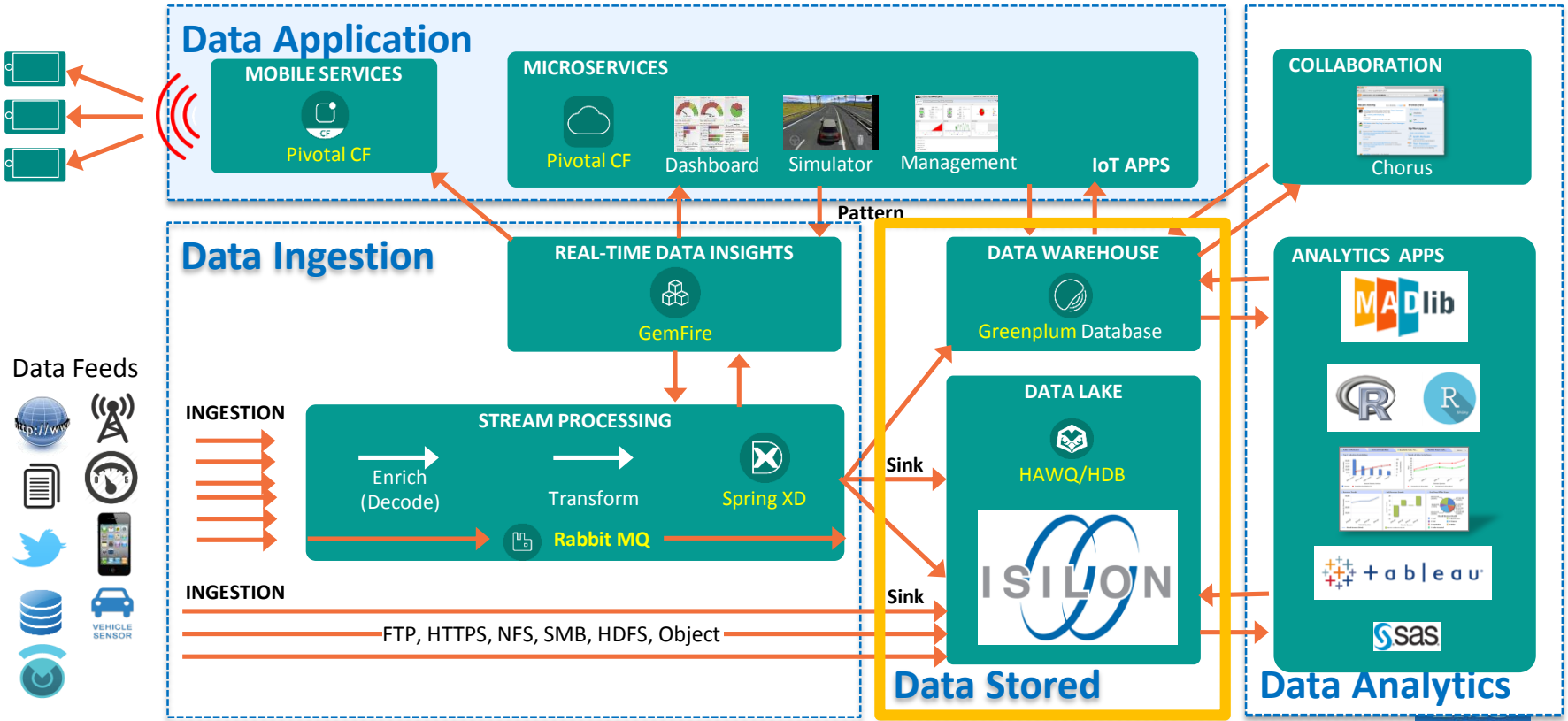
Making things smarter across the IoT ecosystem



ISILON 物聯網大數據平台解決方案



ISILON 車聯網大數據平台解決方案

Captured data:
- Radar
- Lidar
- Video
- GPS
- Ultrasonic
- Vehicle Data
- and more

Data Enrichment
Test management
Report + Analysis

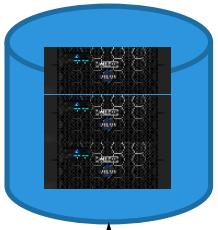
Machine Learning

Analytics

NFS

HDFS

SMB



Load Station

Rest API

Data Join

Geo data

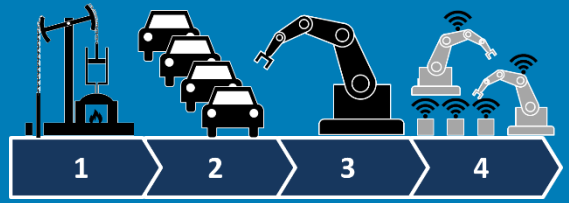
Weather Data

Scale-Out Filesystem
Isilon OneFS

Results
via Rest API
or NFS

Precision Medicine

Smart City



Industry 4.0

Machine Learning
Deep Learning
Artificial Intelligence

HPC
(Life Science)

splunk>

Splunk

Hadoop

IoT

Internet of Things

S3

S3 Apps

Isilon + ECS

- Scale Out
- Distributed
- Multi Protocols
- Enterprise
- Automation

Isilon at Taipei Site

openstack™

Swift Apps

CloudPools
(Auto Tiering)

Geo Replicated

ECS at NewYork Site

ECS at Taipei Site

ECS at London Site

Your IoT Strategy Starts with Storage

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Why Isilon ?

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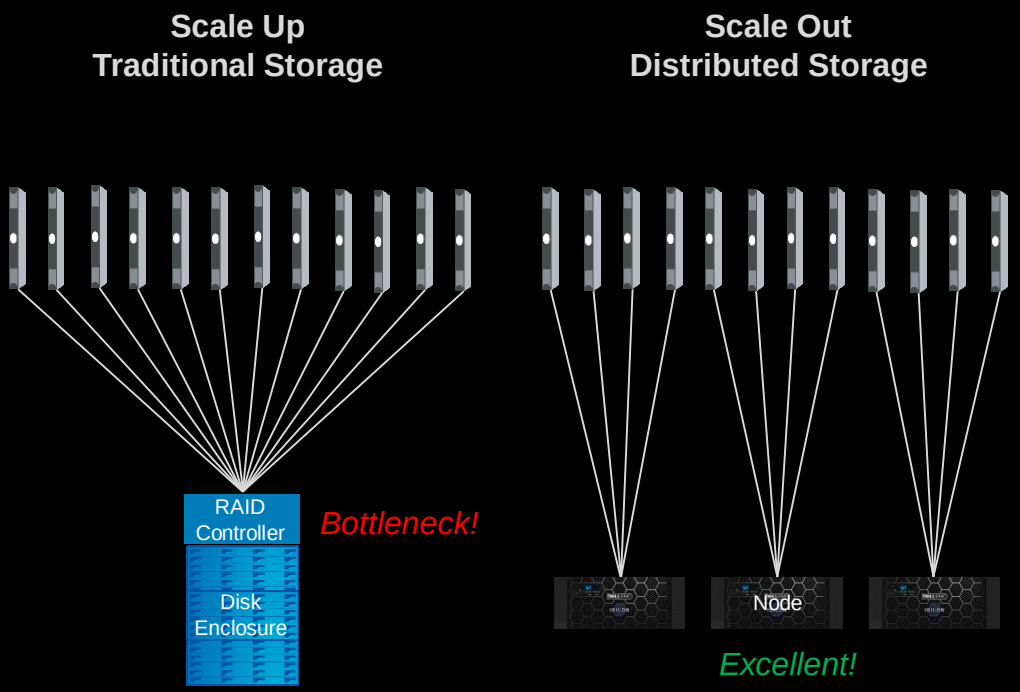
Why Scale Out? Why Isilon?

- Start Small, Scale Fast
  - 因應現今快速變動的業務需求靈活組合, 每次擴充均可同步增加performance與capacity, 並無須手動搬移資料即可平均.
- Distributed Architecture
  - 大數據時代, 目前主流做法是以很多X86 server的“分散式運算”來取代單一UNIX server的“超級運算”. 同樣的storage也該是“分散式儲存”來取代”傳統儲存”, 這樣才可達到真正上下平行無瓶頸的“分散式架構” IT Infrastructure.
- Dev / Ops
  - 而為了提供開發與維運的整體性與敏捷度, 必須原生支援多用途例如, NFS/SMB滿足業務運作, HDFS達到就地分析, Object則適合現代應用.



Isilon Business Momentum

>3.2 Exabytes Shipped Calendar 2016

#1 In Scale-Out NAS Now in All-Flash

>8000 Customers

>17% YoY Customer Growth

Gartner Recognized Leader IDC

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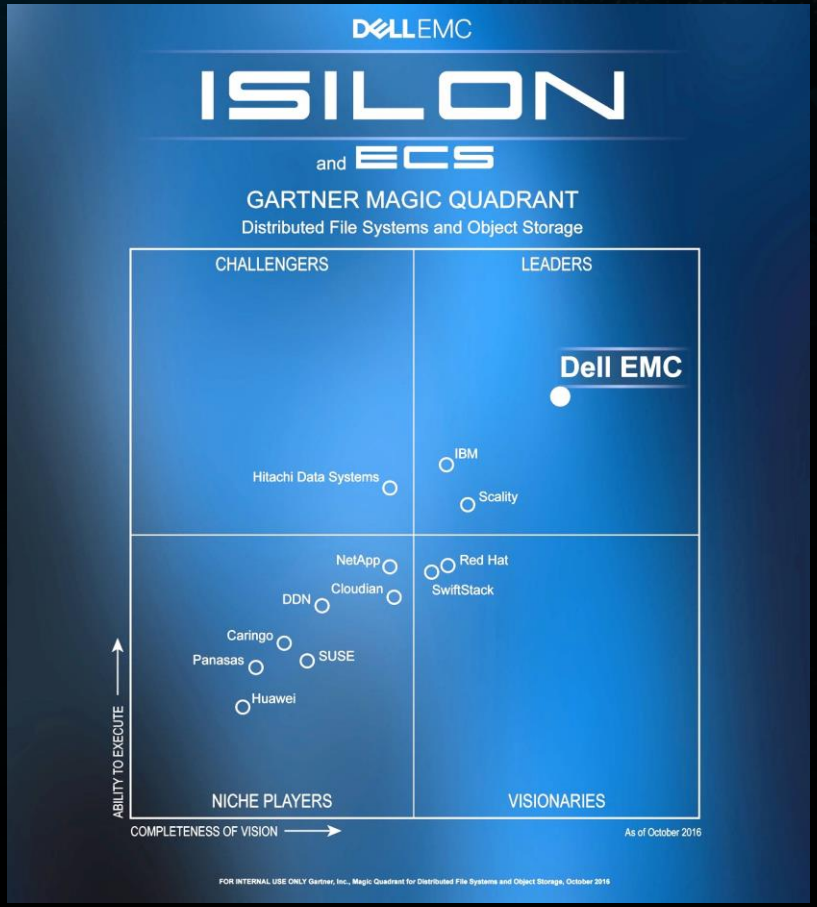
Isilon - The Recognized Leader



Gartner

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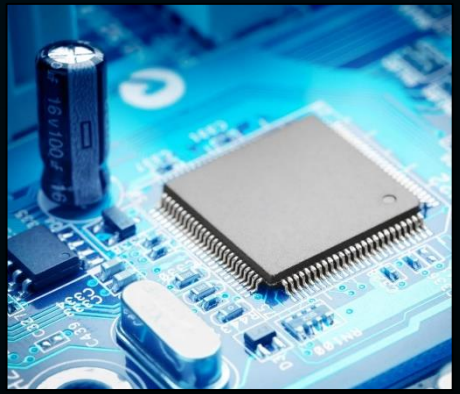
Unstructured Data: Industry Challenges



EDA
Storage Doubling
Every 2 Years

Life Sciences
2X Capacity Growth
Every 12 Months

M+E
Ever Increasing
Resolutions

Enterprise
Faster Outcomes
Lower Costs

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Isilon Workload Consolidation

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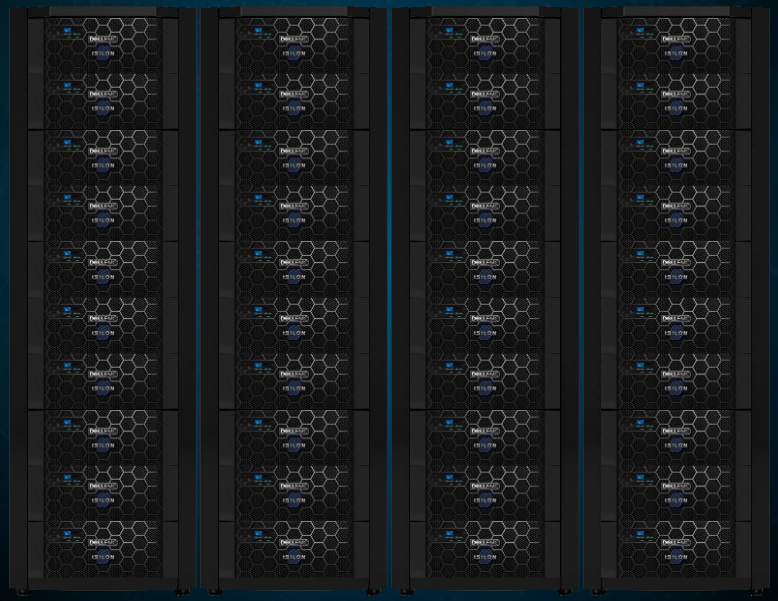
Start Small and Scale

72TBs to
924TBs in 4U



Scale to Over 33PBs

In a Single File System

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TCO Optimization: Simplicity and Ease of Use

Single File System Spans All Nodes

- Automation:
  - NO manual intervention
  - NO reconfiguration
  - NO server or client mount point or application changes
  - NO data migrations
  - NO RAID

Directories and Files Striped Across Cluster

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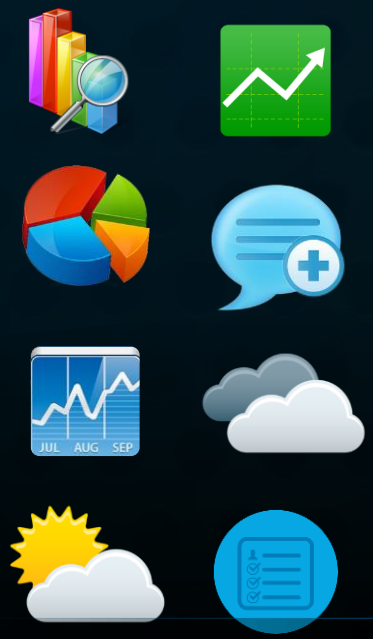
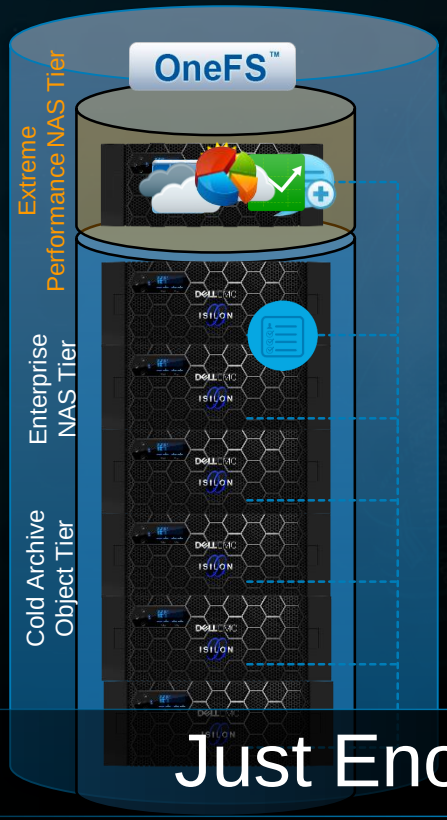
TCO Optimization: Policy-Based Automated Tiering





HIGHEST PERFORMANCE

LOWEST TCO

- Tier Between Performance, Enterprise and Archive Nodes
- Transparent to Users and Applications

Just Enough Flash

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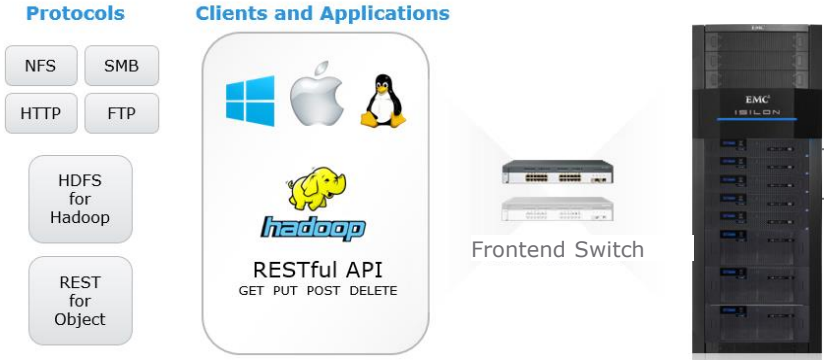
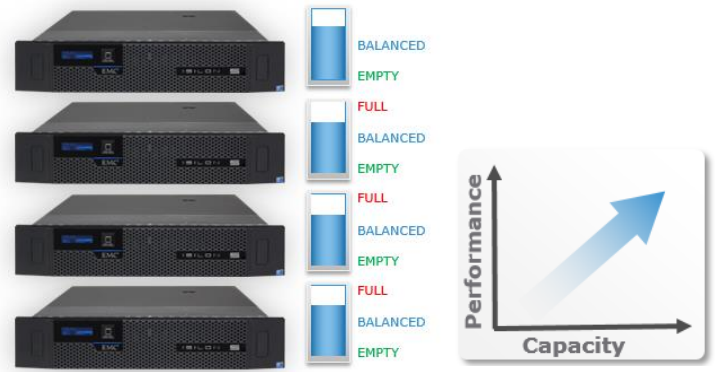
ISILON INTRODUCTION AT A GLANCE

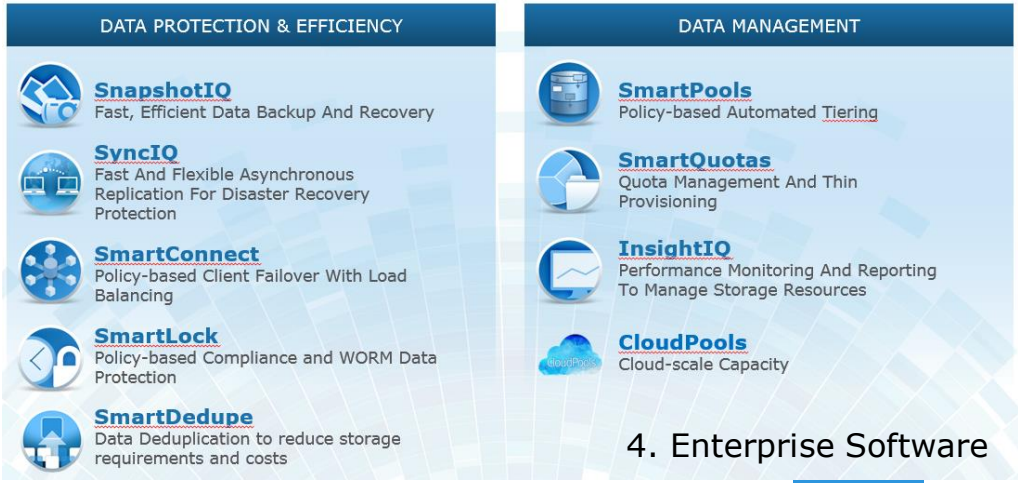


1. Multi Protocols & Network Load Balancing

2. Distributed File System & Up to N+4 Data Protection



3. Capacity Auto Balance & Scale Out



4. Enterprise Software

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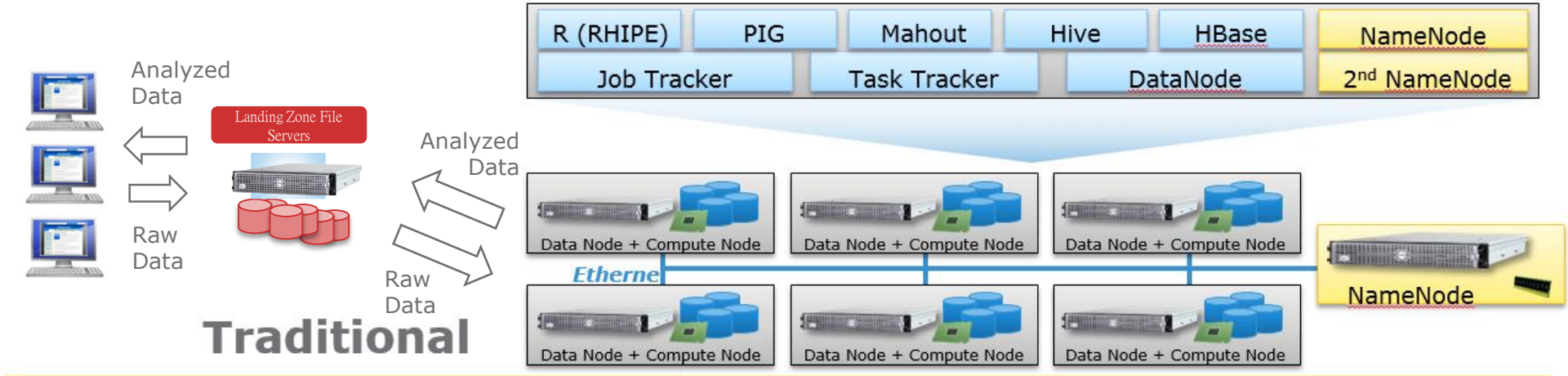
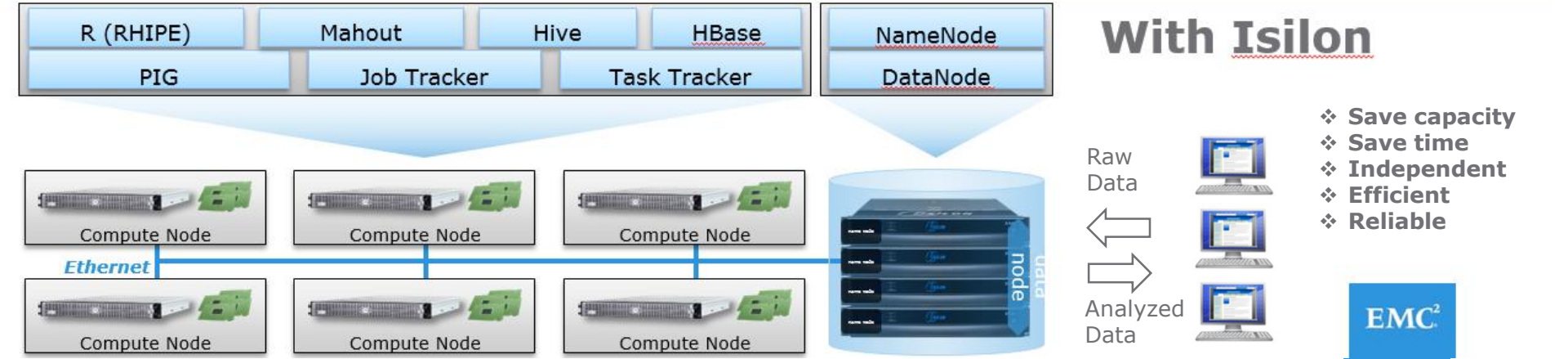
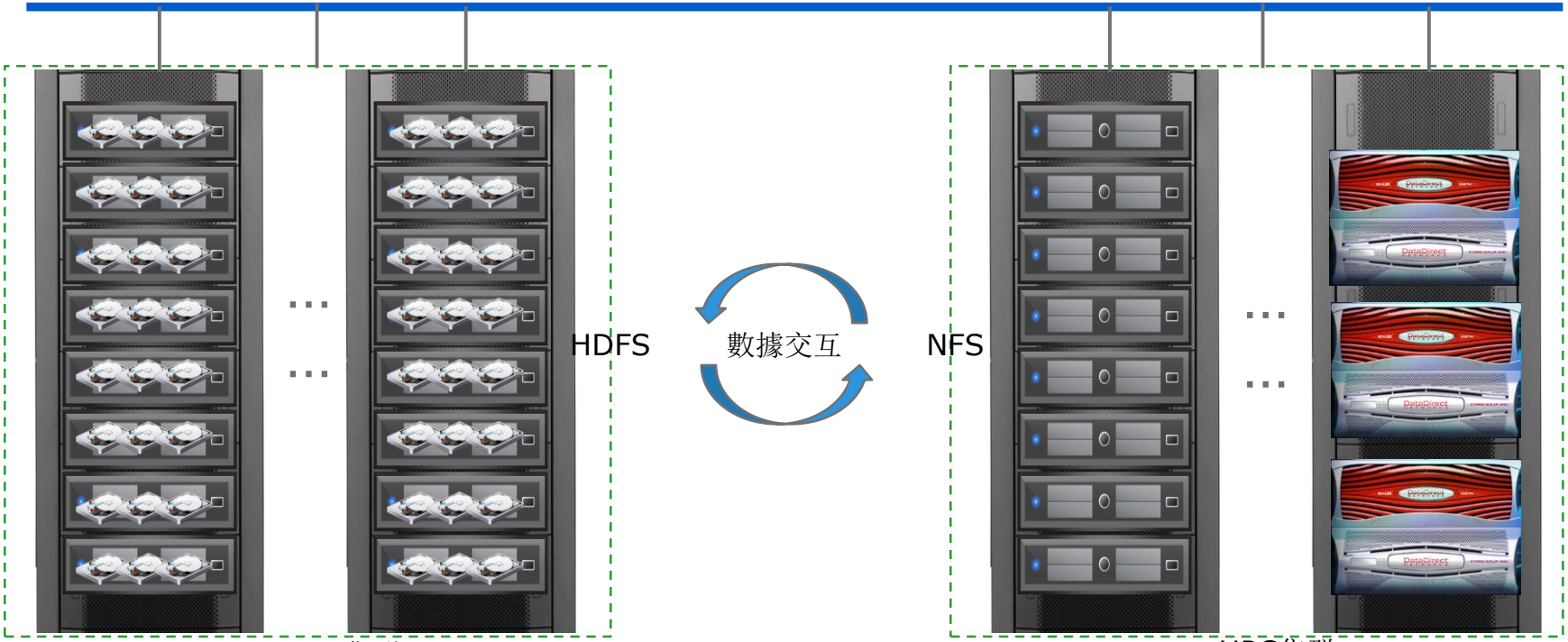
HADOOP ARCHITECTURE COMPARISON

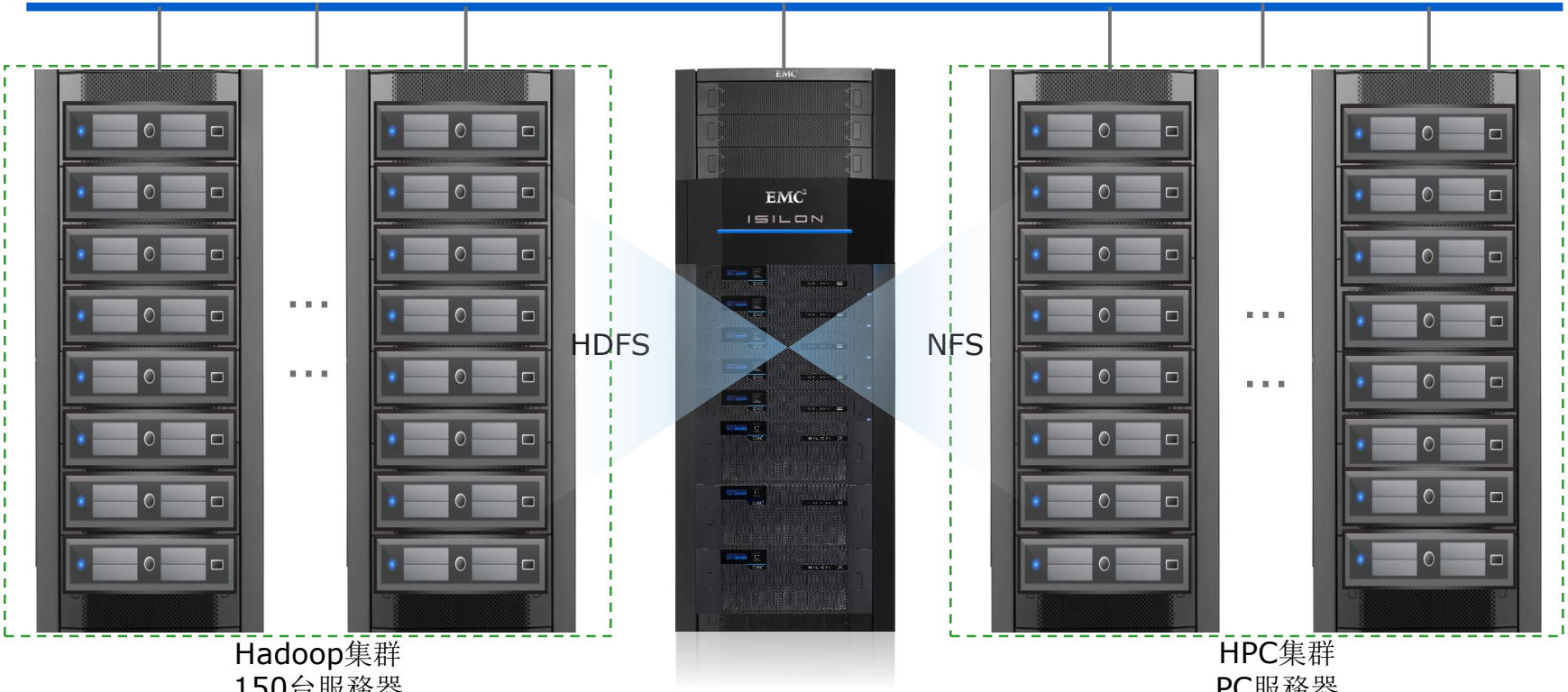




中國某客戶大數據分析平臺既有架構



中國某客戶大數據分析采用Isilon建議架構



Smart and Efficient!

Why ECS ?

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Elastic Cloud Storage

A modern storage platform to bridge traditional and modern workloads.

48%
Lower TCO than public cloud

26%
Higher Storage Density

SCALABLE

- Shared global storage that scales into Exabyte
- Globally distributed infrastructure

INTELLIGENT

- Support for real-time data ingestion and analytics

FLEXIBLE

- ECS Appliance
- Software only
- ECS Dedicated Cloud (ECS DC)

ENTERPRISE-READY

- Enhanced enterprise capabilities (litigation hold support, Swift multi-part upload, etc.)

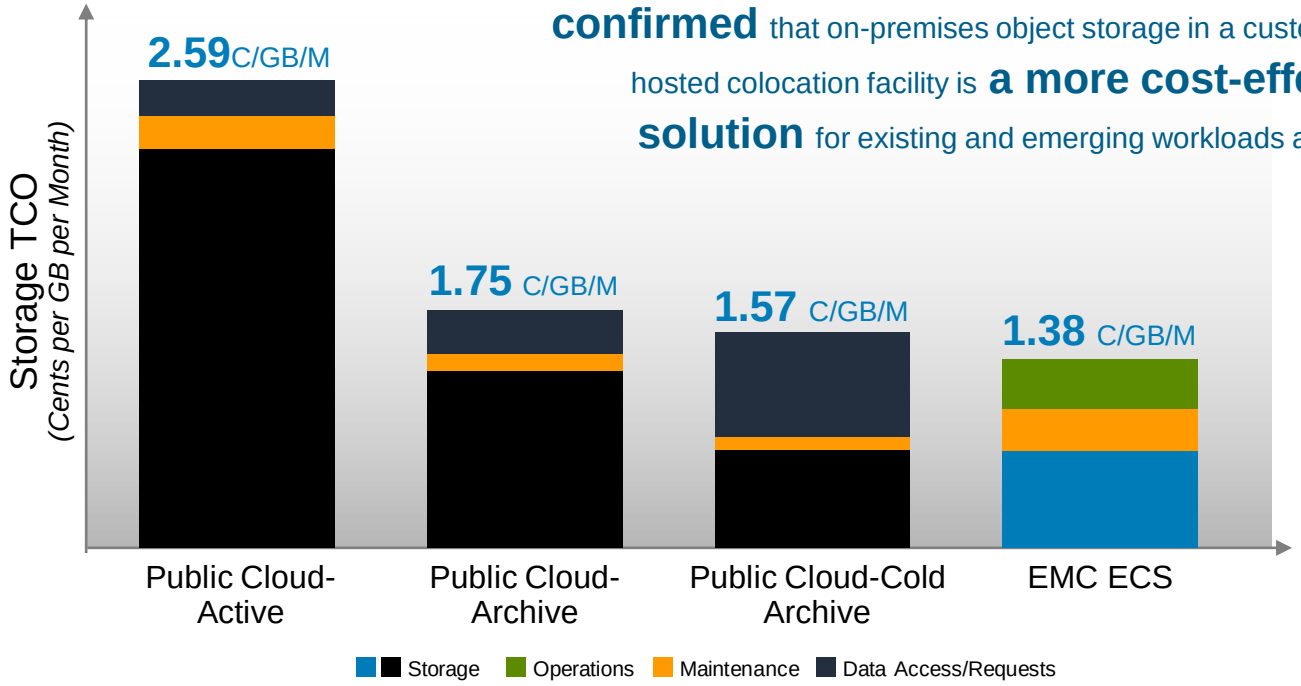
COST EFFECTIVE

- 48% lower TCO than public cloud storage
- Lower TCO than tape

Dell - Internal Use - Confidential

48% Lower TCO than Public Cloud

"**An ESG audit** of a Dell EMC total cost of ownership model has **confirmed** that on-premises object storage in a customer-owned or hosted colocation facility is **a more cost-effective solution** for existing and emerging workloads at scale"



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ECS Target Use Cases

Geo-Protected Archive

Global Content Repository

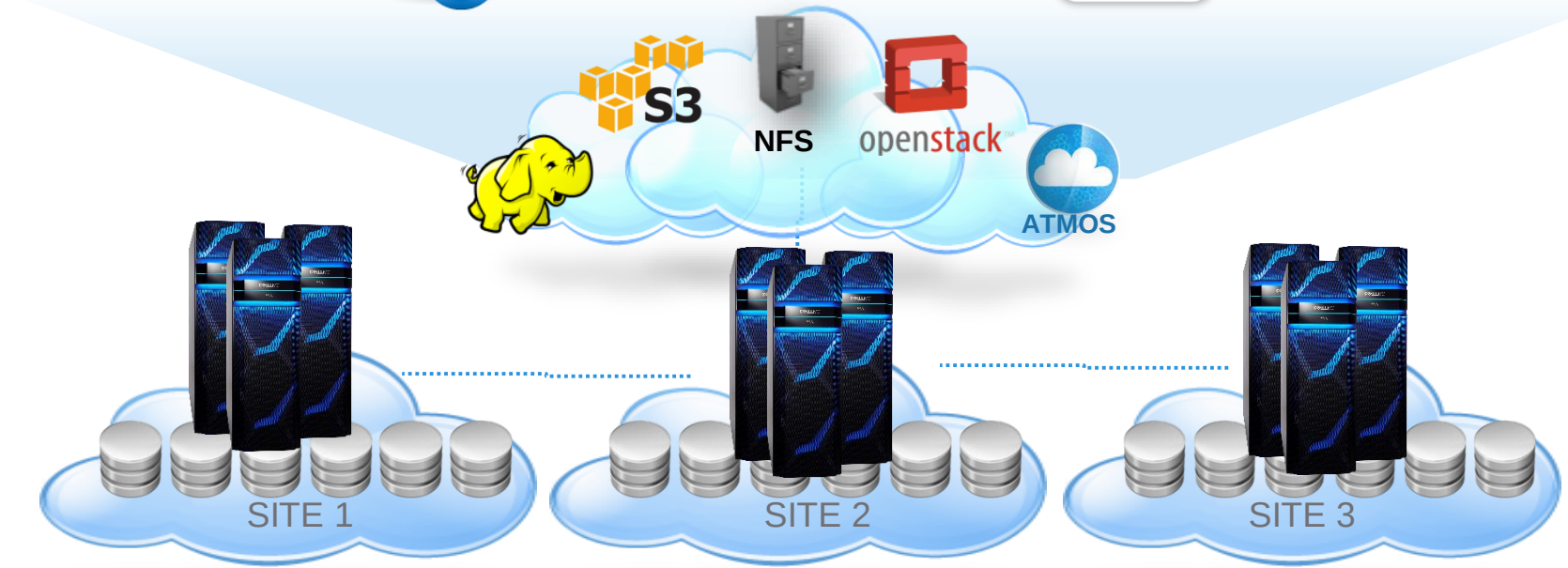
Video Surveillance

Storage for IoT

Modern Applications

Data Lake Foundation

Global Analytics/Data Protection



Scale Effortlessly - Store Efficiently - Access Globally

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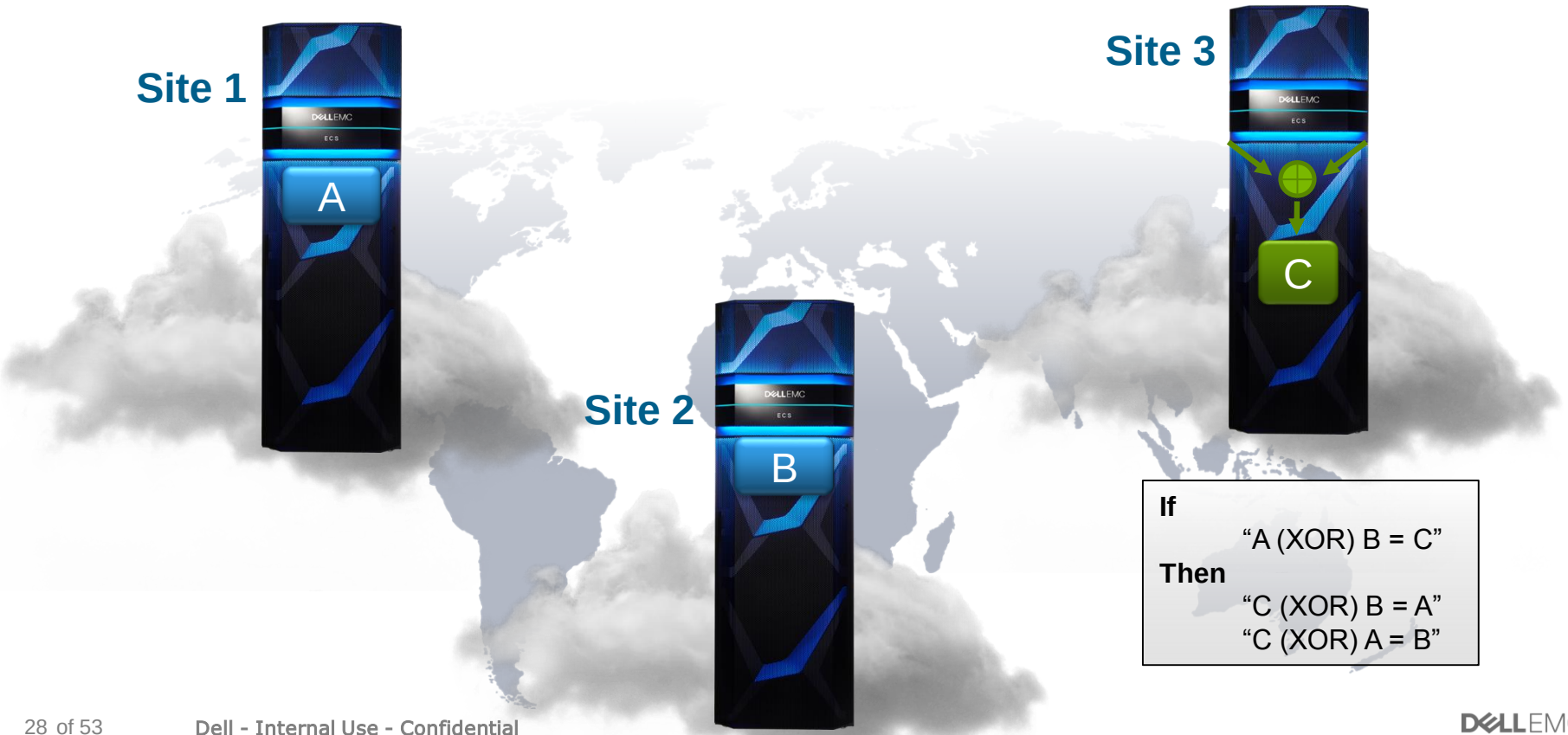
DELL EMC

Geo-Distributed Storage Overhead Reduction



If

"A (XOR) B = C"

Then

"C (XOR) B = A"

"C (XOR) A = B"

Dell - Internal Use - Confidential

DELL EMC

Isilon CloudPools and ECS: Integrated and Automated

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Metadata Search And Management

Access Metadata Without A Dedicated Database

LESS DEVELOPMENT EFFORT

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DELL EMC

ECS Momentum

More than **4 EB** shipped

"EMC's ECS solution, ultimately, offers a foundation upon which IT organizations can build out the next generation of applications and workloads."

Enterprise Strategy Group

"ECS has the one of the best Object Storage architectures suited for 3rd Platform applications."– Ashish Nadkarni

IDC Analyze the Future

"The wave of SDS takes commodity hardware and raises it to new levels. ECS helps users ride that wave being ideal for modern, web-scale cloud applications."

STORAGE REVIEW.COM

Over **700** customers are using ECS

"Software-defined storage overcomes the restrictions of hard-wired architecture and delivers the benefits needed in today's dynamic datacenter environment."

verizon

"We don't worry about applications that need to span more than one data center."

global access

"The role of ECS is important because it's fast storage at low cost."

"The most impressive was the fact, that real-life performance appeared twice higher and more effective."

tenzor

ECS is compatible with the top ISVs

VERINT

Interlock Technology
Archive Migration Specialists

Datadobi

DATATRUST SOLUTIONS

syncplicity

NICE

HORTONWORKS

seven10 STORAGE SOFTWARE

splunk>

Metalogix

CLOUDARRAY

OnBase by Hyland

IBM InfoSphere Optim

cloudboost

Conclusion

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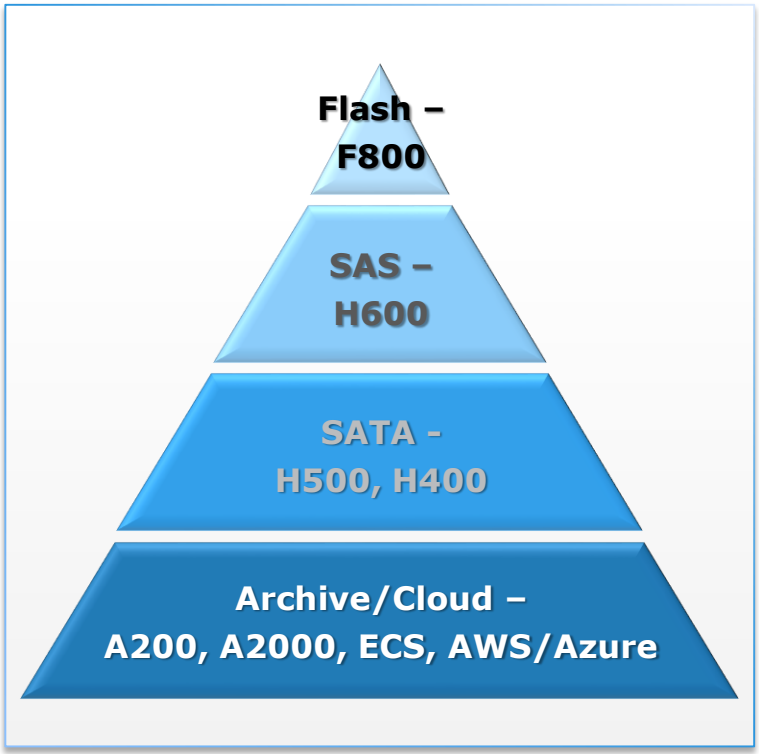
ISILON+ECS OVERALL STRATEGIC PLANNING

Vertical View & Business Benefits



- **True Scale Out:**
  - Add nodes for both capacity and performance when required
- **Efficient Management:**
  - OneFS rich enterprise features, minimize human efforts
- **Optimized Utilization:**
  - No capacity islands, no performance hotspots
- **Reduced Total Cost:**
  - Multi-tiers design

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SIMPLE IS SMART 簡化儲存管理, 提升應用價值

- Scale-Out擴充node同時增加效能與容量, 保護既有投資不用汰換.
- 保護層級可彈性選擇, 精細度可到目錄, 最高4 drive failure or 4 node failure.
- OneFS分散式檔案系統對內資料Auto Balance完全平均分散無熱點, 完全無需手動搬移資料, 並最佳化使用空間.
- Metadata in SSD, 利用少量SSD達到大幅提升整體效能的效果.
- SmartConnect對外網路連線自動Load Balancing負載平衡無瓶頸.
- SmartPools自動分層Auto Tiering, 無須手動搬移資料, 且可彈性組合不同Node提升利用率降低整體成本. CloudPools可進一步自動分層到ECS上, 作為一個NAS+object storage的完整自動方案.
- 原生支援HDFS可直接做Hadoop資料分析, 或是做Hadoop空間擴充.
  - OneFS演算法保護資料可用空間80%, 若DAS複製3份可用空間只有33% (HDFS 3.0可做EC但效能不佳)
  - 支援multi protocol (NFS/SMB/FTP/HTTP/HDFS) 不用費時費力設法傳輸資料
  - 根據需求彈性獨立擴充或升級compute or storage
  - 同時兼具enterprise storage功能如upgrade/security/snapshot/DR/dedupe /auto tiering/multi tenancy等...

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作為獨立的OBJECT STORAGE, ECS 的獨家優勢

- 可以做為Isilon的無限延伸, 支援CloudPools自動分層, 進一步節省成本.
- 可以做為EMC其他產品的延伸, 透過CloudArray, CloudBoost和CloudTier.
- 支援Multi Protocol (S3/Swift/NFS/HDFS) 不用費時費力設法傳輸資料.
- 可以做到多地Geo Replication的Erasure Coding, 擁有最佳化的空間使用率.
- 原生支援Metadata Search, 有助於現代應用程式的開發.
- ECS是Turnkey Solution, 免除繁雜的安裝, 設定與管理, 有非常好的使用者體驗, 無限擴充空間, 永續保護資料, 讓IT資訊人員可以專注於更有價值的工作產出.

Questions?

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