S3 DAY

Données de la recherche et cahier de labo électronique : quelles solutions ?

ECS (Elastic Cloud Storage), la souplesse de l'offre de stockage en mode objet de Dell EMC

Christophe COUTY
Responsable Commercial Grand Est ESR

Olivier DELETREZ
Expert Cloud Solutions @cloud_attitude

DELL Technologies :
la force d’un groupe, la proximité d’une équipe locale

DELL Technologies

DELL EMC Pivotal RSA Secureworks virtustream vmware

Une équipe dédiée aux clients ESR depuis l’existence du marché Matinfo

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ECS Elastic Cloud Storage

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CLOUD-ENABLED INFRASTRUCTURE

Cloud data mobility

Freely move data to and from cloud storage.

New!

ECS ISILON

New!

Isilon CloudPools

Move Isilon unstructured data to/from cloud storage

DataFrameworks

Move Isilon unstructured data to/from cloud storage

Cloud Tiering Appliance

Move Dell EMC Unity data to/from cloud storage

Data Domain Cloud Tier

Move backup copies to/from cloud storage

CLOUD CONSUMPTION

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DELL EMC

CLOUD-ENABLED INFRASTRUCTURE

Cloud data protection

Data Domain Cloud DR

Use the public cloud as your disaster recovery site

Data Protection Suite

Use cloud storage for backup and retention

Cloud Snapshot Manager

Backup and recovery for public cloud workloads

Now Microsoft Azure

Data Domain Virtual Edition

Scalable software-defined protection storage running in the cloud

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CLOUD-ENABLED INFRASTRUCTURE

Cloud data services

Consistent operations for your data services.

New!

New!

Isilon Cloud for Google Cloud Platform

No compromise cloud-resident file services

Virtustream Storage Cloud

A resilient hyperscale storage platform

ECS

Persistent object storage for cloud-native apps

CloudLink

Encryption and key management

Dell EMC UnityVSA Cloud Edition

Full-featured software-defined storage capabilities deployed in the Cloud

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Les données non structurées

- Qu’est-ce que c’est?
  - Fichiers de type bureautique (word, excel, powerpoint, pdf)
  - Fichiers de type média (images, audio, vidéo)
  - Fichiers de type texte (log, txt, code source)
  - Fichiers de type binaire générés par une application

- Pourquoi une infrastructure spécifique pour les stocker?
  - 80% du volume des données au niveau mondial
  - Croissance explosive (x2 tous les deux ans)
  - Enjeu de la transformation digitale

Initiatives de la transformation digitale

BIG DATA

CLOUD NATIVE APPS

INTERNET OF THINGS

ML/DL/AI

DONNEES NON STRUCTUREES

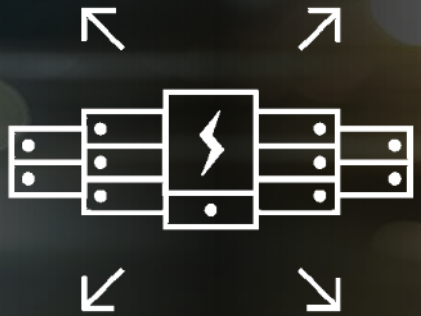
Tendances autour des données non structurées

- Fonctionnalités Clés
  - Accès aux données multi-protocoles
  - Data réduction
  - Data protection adaptée aux disques haute densité et aux grands volumes de données
  - Support multi-tenant
  - Intégration Cloud

- Évolution des architectures
  - Architecture scale-out
  - Architectures multi-sites: 2 ou 3 sites
  - Consistance globale forte
  - Utilisation du flash (cache ou média de stockage principal)
  - Nouveaux modes de consommation (paiement à l’usage, hébergement partiel ou total)

ECS

Scale-Out Objet



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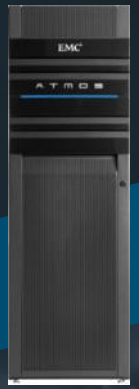
Evolution du stockage objet Dell EMC

CENTERA (2002 - 2018)

- Données non structurées
- API Objet CAS
- Archivage et immutabilité
- Espace d'adressage global



ATMOS (2007 - X)

- Données non structurées
- + API REST propriétaire
- Espace d'adressage global
- + Géo réplication
- + Multi-tenant

ECS (2014 - X)

- API Objet universelle
- CAS (CENTERA API)
- ATMOS
- S3 & OpenStack Swift
- Compatible fichier et analytique (CIFS/SMB, NFS, Hadoop)
- Géo distribution efficace

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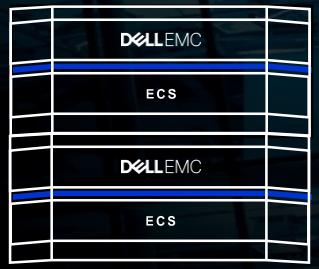
Consume ECS on Your Terms



TURNKEY APPLIANCE

CLOUD SERVICE PROVIDERS

SOFTWARE

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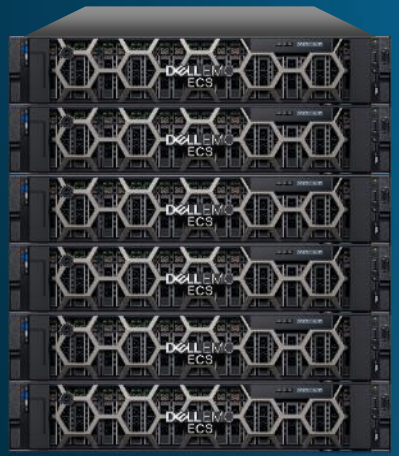
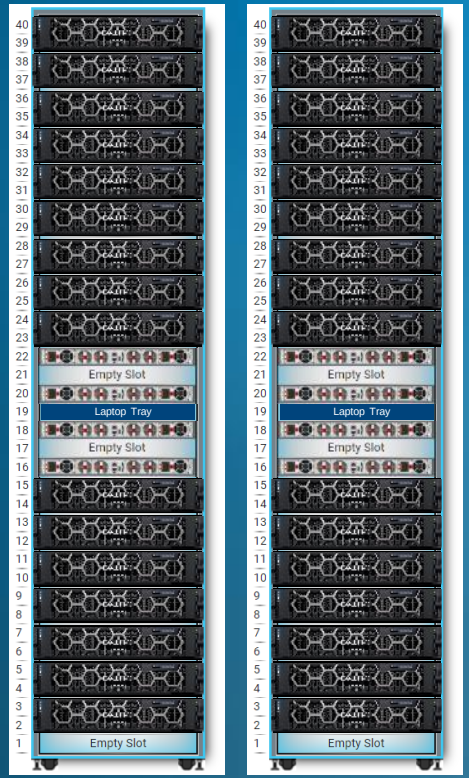
ECS Gen3: Scale-Out Objet

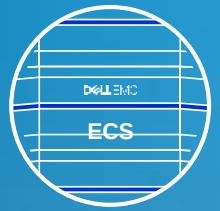
Commencer avec 5 noeuds

Etendre Noeud par noeud



Remplir & Chaîner des Racks





Point d'accès unique
Namespace unique

Chaque Nœud augmente la capacité & la performance

Pas de limite max en nombre de noeuds

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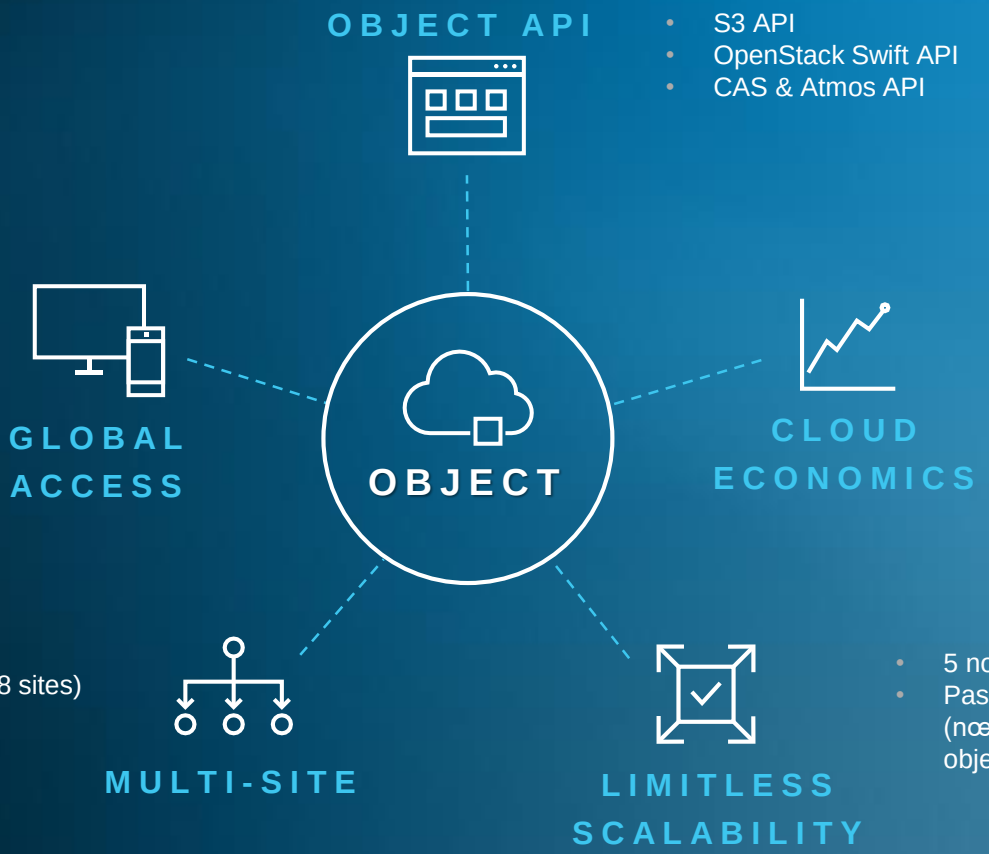
Fonctionnalités ECS



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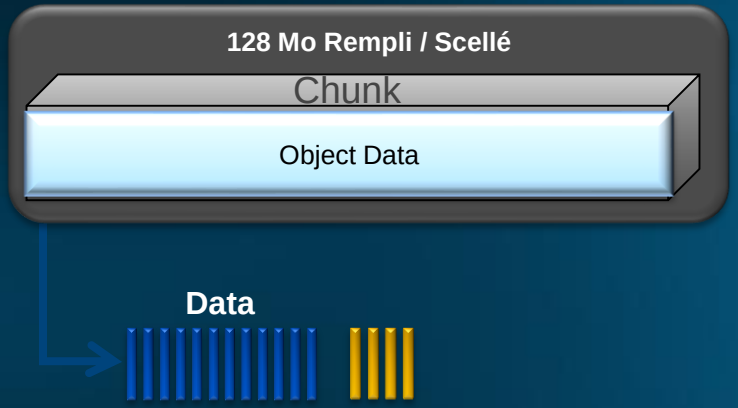
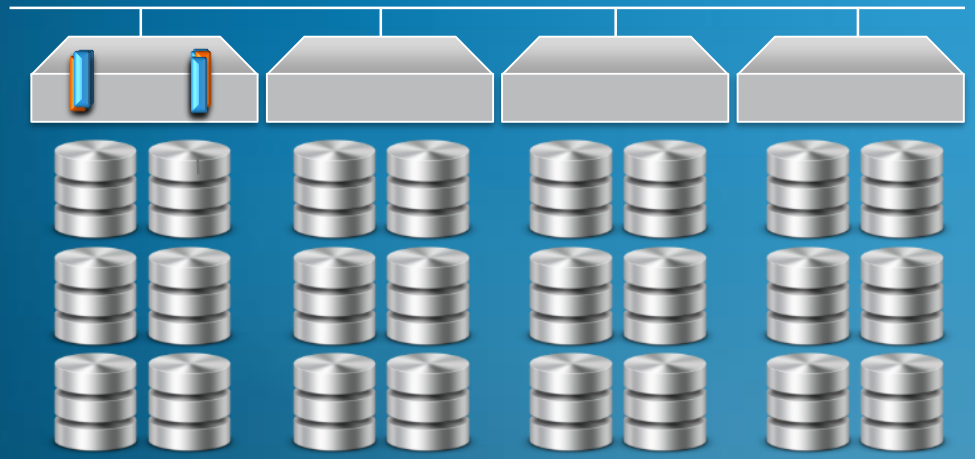
Erasure Coding



Erasure Coding:
12 fragments de données (= Chunk)
+ 4 fragments de protection



Tolérance de panne: 4 disques ou 1 noeud

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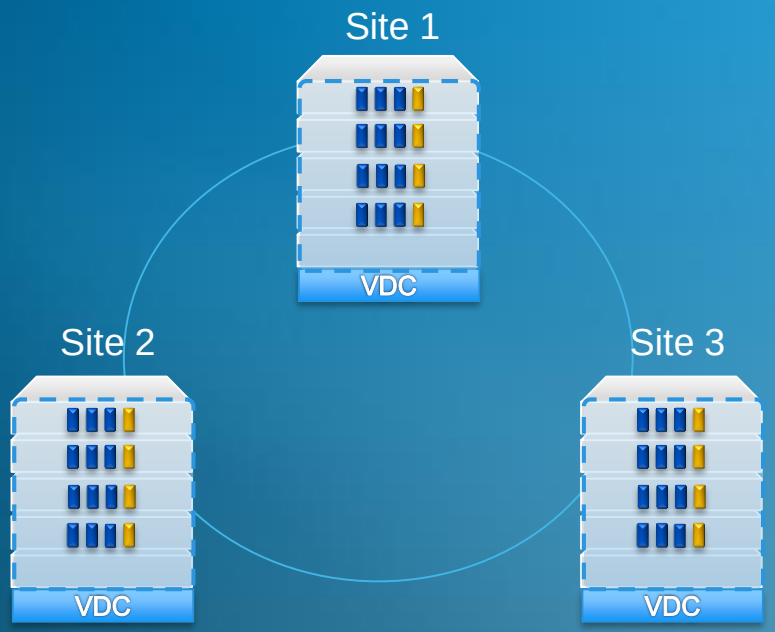
Architecture ECS: Géo-fédération

Géo-Protection des données

- Réplication globale
- Erasure Coding local
- Consistance globale forte

Encodage hybride XOR

- Réduction de l'overhead de protection
- Architecture géo-active ou géo-passive



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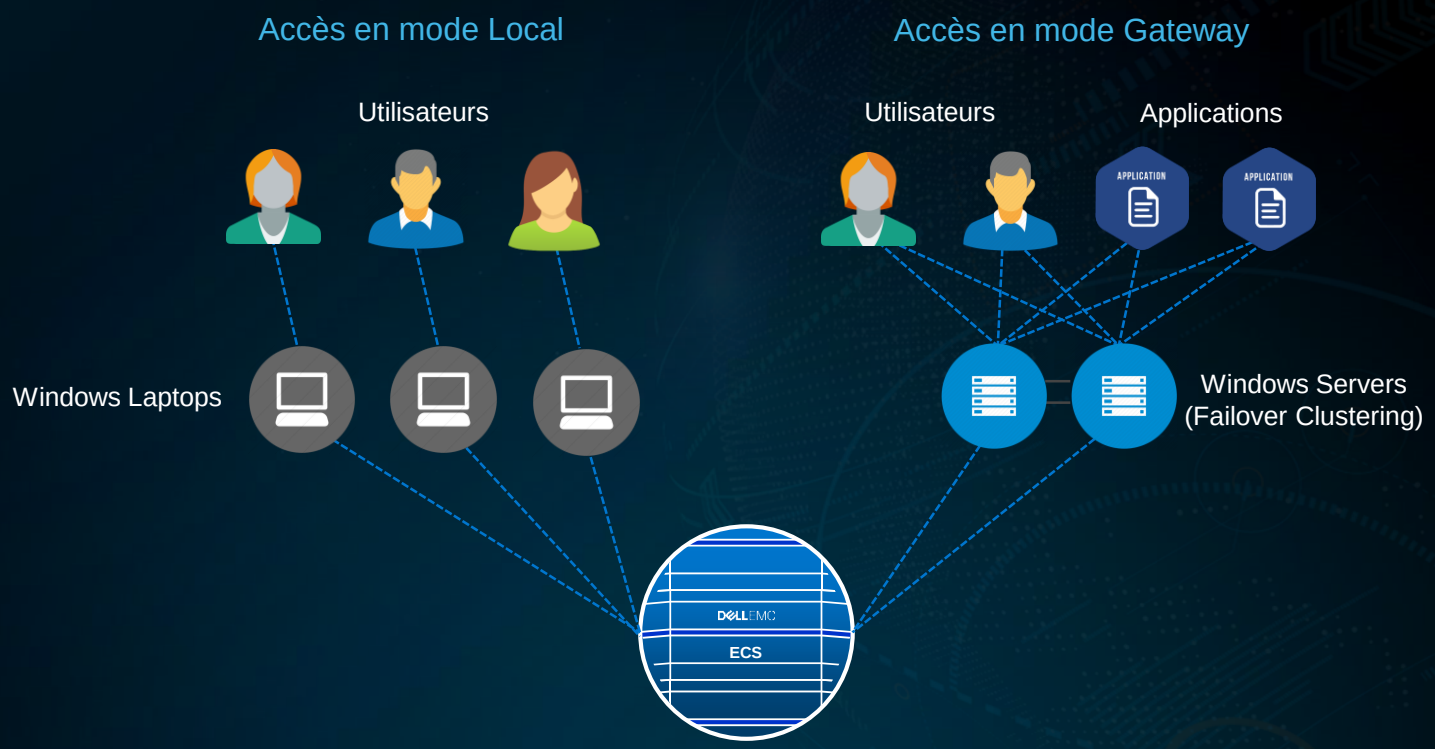
Architecture GeoDrive



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GeoDrive

- Application Windows permettant un accès aux données ECS (upload / download) avec mise en cache locale

- Fonctionnalités principales
  - Espace de stockage Cloud (S3) monté localement dans Windows
  - Mode Miroir ou Push to Cloud (Stubbing)
  - Multi-part upload (synchrone ou asynchrone) et Multi-part download
  - Compression & Chiffrement AES256bit des flux
  - Versioning
  - Partage avec URL temporaires
  - Compatible avec les fonctionnalités WORM pour l’archivage légal

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Appliance ECS Gen3

1 2

+

3

OU

4

OU

5

1 **2x Switches Front-End 25GbE**
- Switches Dell S5148F-ON
- Connexion à chacun des noeuds ECS
- Connexion au réseau client (1/10/25/100 GbE)
- Peuvent être remplacés par des switchs client

2 **2x Switches Back-End 25GbE**
- Switches Dell S5148F-ON
- Switches privés pour le management

3 **Noeuds ECS EX300**
- Châssis 2U (1 noeud)
- Intel x64 CPU 8 cores, 64GB RAM
- 12 disques SATA 1, 2, 4, 8TB

OU

4 **Noeuds ECS EX500**
- Châssis 2U (1 nœud)
- Intel x64 CPU 2x 10 cores, 64GB RAM
- 12 ou 24 disques SATA 8, 12TB

OU

5 **Noeuds ECS EX3000**
- Châssis 4U avec 1 ou 2 nœuds
- Intel x64 CPU 2x 8 cores, 64GB RAM
- EX3000S: châssis single node
  - 45, 60 ou 90 disques SATA 12TB
- EX3000D: châssis dual nodes
  - 60 ou 90 disques SATA 12TB

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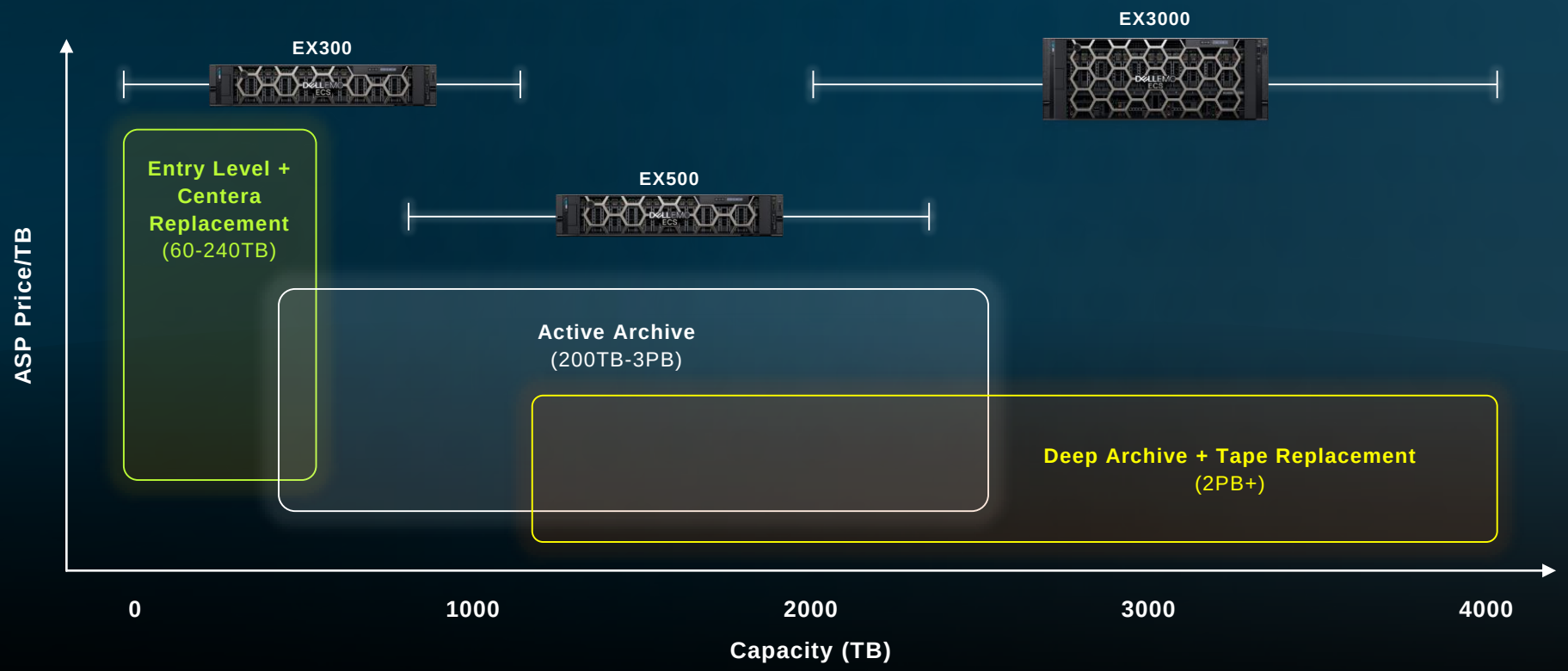
ECS EX500 /Use case positioning



ECS EX500 /Product portfolio and positioning

ECS Gen3 EX Series:

- Scalable & flexible
- Intelligent
- Enterprise Ready
- Future-proof

Small Enterprise — EX300

Midsize Enterprise — EX500

Large Enterprise — EX3000

	EX300 12TB	EX300 24TB	EX300 48TB	EX300 96TB	**EX500 192TB**	**EX500 288TB**	EX3000 1Node 1080TB	EX3000 2Node 1080TB
Memory	64GB	64GB	64GB	64GB	**64GB**	**64GB**	64GB	64GB
CPU/ PE Server	8 core	8 core	8 core	8 core	**2 x 10 core**	**2 x 10 core**	2 x 8 core	2 x 8 core
Disk per node	12 x 1TB	12 x 2TB	12 x 4TB	12x 8TB	**12 / 24 x 8TB**	**12 / 24 x 12TB**	45 / 60 / 90 x 12TB	30 / 45 x 12TB
Rack capacity Min	60TB (36TiB)	120TB (71 TiB)	240TB (143 TiB)	480TB (285TiB)	**480TB (285 TiB)**	**720TB (428 TiB)**	2700 TB (1603 TiB)	2160 TB (1283 TiB)
Rack capacity Max	192TB	384TB	768TB	1536TB	**3072TB**	**4608TB**	8640 TB	8640 TB
Networking Connections	2 x 10GBE 2 x 10GBE	2 x 10GBE 2 x 10GBE	2 x 10GBE 2 x 10GBE	2 x 10GBE 2 x 10GBE	**2 x 25GBE 2 x 25GBE**	**2 x 25GBE 2 x 25GBE**	2 x 25GBE 2 x 25GBE	2 x 25GBE 2 x 25GBE

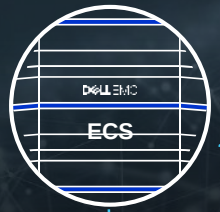
Cas d’usages ECS

Cas d’usages classiques

- Archivage
- Cloud Backup
- Distribution de contenu web
- Tiering Cloud

Transformation digitale

- Applications compatibles S3 (Cloud Native)
- IoT
- Hadoop



Conforme aux normes NF Z42 & ISO

De 1 à 8 sites avec accès global unique

Ecosystème d’applications de Backup & Archivage

Compatible Isilon CloudPools & Data Domain Cloud Tier

Objet (S3, Swift), Fichier (SMB, NFS), CAS & ATMOS

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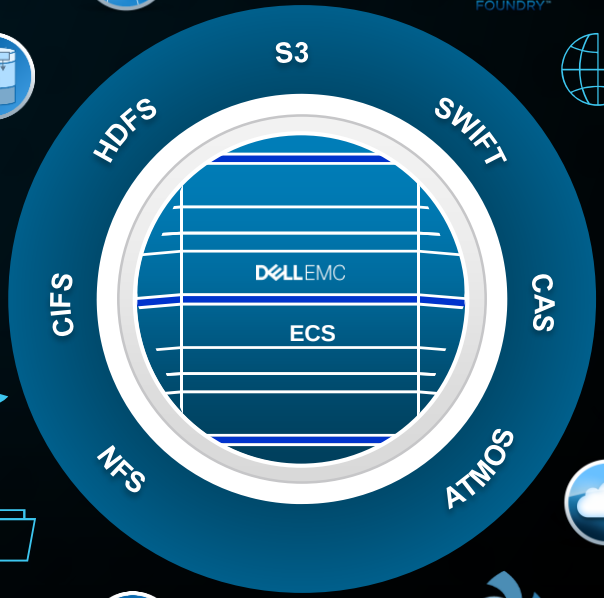
ECS Use Cases



Modern Apps/Cloud Apps

Pivotal Cloud Foundry (PCF)

IOT

In Place Analytics – HDFS/S3a

Log

CloudBoost Virtual Appliance

Data Domain Cloud Tier

Sync & Share, SharePoint Blobs

Compliance,
Enterprise Content Manager,
GDPR/SEC

Isilon CloudPools (S3)

Archive Gateway (NFS/CIFS to S3 Object)

Security, Audio, Video Archiving

TSM, Commvault (S3)

NetWorker, Avamar, NetBackup

Backup - Tape Replacement

Centera Migration

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Résumé

	ECS	Vmware Cloud on AWS	AWS	Azure	Google Cloud Plateform
CTA VE	Y		Y	Y	
Unity VSA		Y			
Isilon Cloud (OneFS)					Y (warning région)
Isilon Cloudpool	Y		Y	Y	
DD Cloud Tier	Y		Y	Y	
DD VE			Y	Y	
DD Cloud DR			Y		
DDMC			Y	Y	
Cloud Snapshot manager			Y		
NetWorker VE		Y	Y	Y	
Avamar VE		Y	Y	Y	
Bundle AVE +DDVE			Y	Y	
DPS for VMware		Y			

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Isilon CloudPools

Smart Tiering to Object Store

KEY FEATURES

- Stub to ECS
- Ability to send encrypted data to the cloud
- Compression for efficient transport
- Simple policy based management
- One accessible namespace

BENEFITS

- Combine file & object store benefits
- Use stubs to optimize local storage space, with offsite archive protection
- Seamless placement and availability of data per policy
- Limitless capacity

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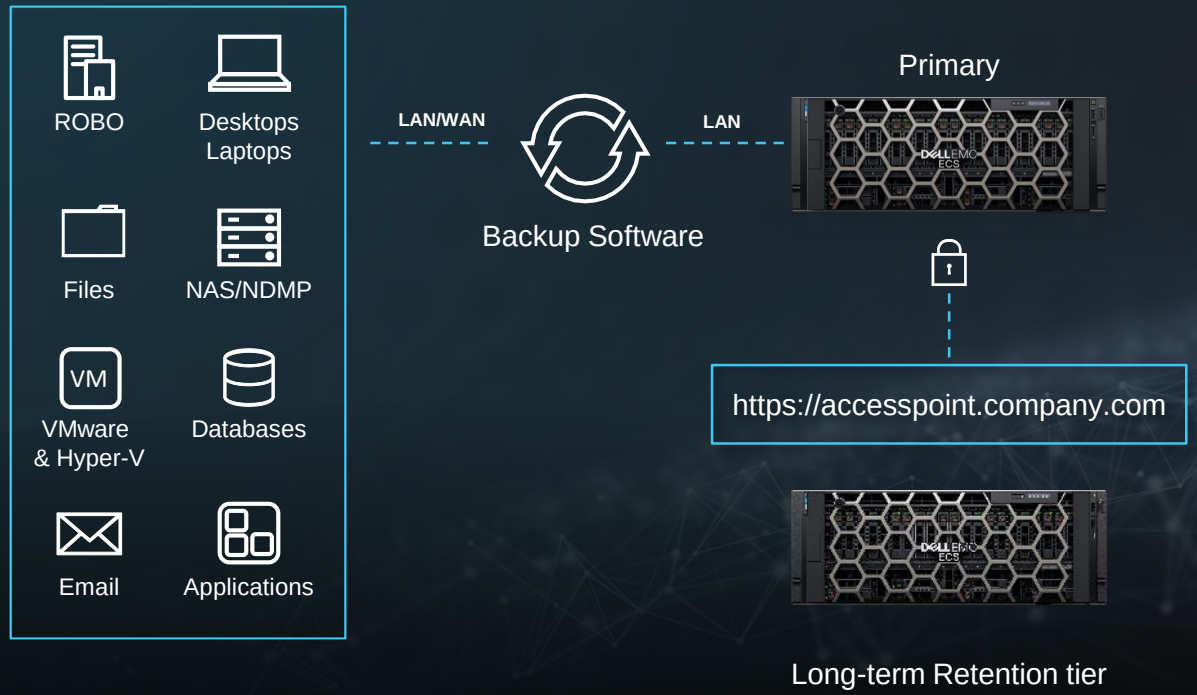
Data Domain Cloud Tier with ECS



KEY FEATURES

- Deduplication at both active tier and cloud tiers
- Built-in policy engine for data movement with DD Management Center
- Cloud-scale capacity of 3x Data Domain system capacity

BENEFITS

- Lower TCO when compared to public cloud storage providers
- Comparable TCO to tape
- Unlimited Capacity
- Efficient Recoverability
- Multiple unstructured configuration options to suit your storage needs

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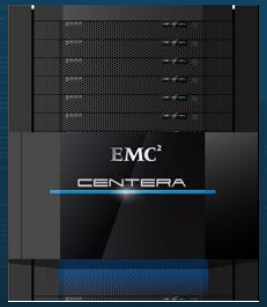
Centera Modernization With ECS

Self-Migration and Automatic Integration.

Centera



60TB starting point

ECS

85% minimum capacity reduction

Self-migration

- No downtime. No disruption.
- No professional services required

Automatic integration

- Direct support of Centera CAS
- No change to existing applications
- Connect archive to new applications and services
- Single namespace

Full functionality

- Content authenticity
- Governance and compliance
- High availability
- Efficient operation
- CAS integration
- Broad partner ecosystem
- Modern S3 infrastructure for everything object

Forte présence de Centera dans le secteur de la santé

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Challenges with Traditional Storage Platforms

Traditional storage systems have high costs, especially for applications that work with lots of data.

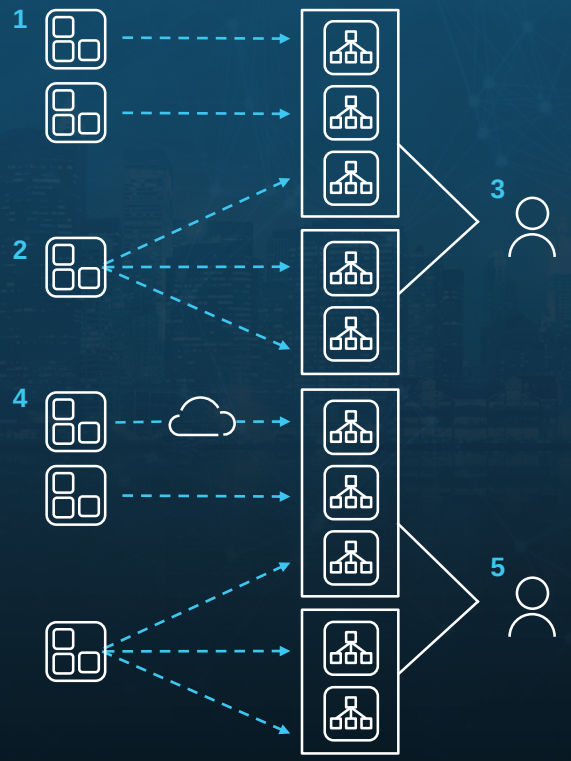
1
Giving each application its own file system leads to under-utilized storage capacity

2
Handling large amounts of data creates costly complexity for developers

3
Backup and disaster recovery consume physical and human resources

4
Accessing data over the internet is hard

5
Development teams must wait for storage admins to allocate new file systems



Modernization Mitigates These Challenges

- Reclaims expensive existing primary storage
- Less on-going primary storage acquisition costs
- Gets static data out of the recurring backup process
- Less backup storage acquisition costs
- Less management and operating costs
- Short provisioning time

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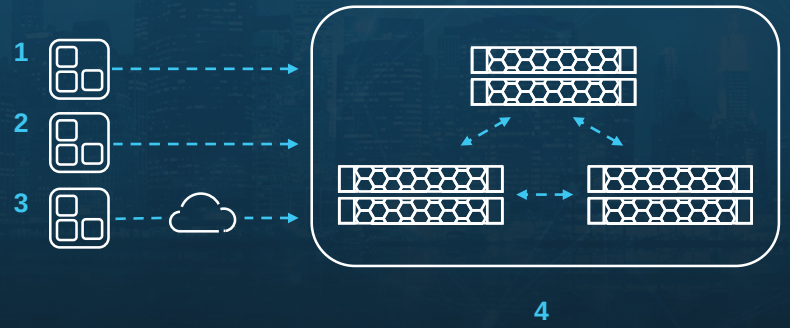
How ECS Works

- A shared object store uses storage more efficiently
- Applications see even massive amounts of data through a single namespace
- RESTful interfaces allow direct internet access to data



- Geo-replication eliminates the need for backup and disaster recovery

KEY FEATURES

- Multi-tenant service
- Geo-replication of data across multiple nodes
- Metadata search and management
- Multi-protocol support
- Direct internet access to data via HTTP

BENEFITS

- Efficient shared object store
- Simple global namespace for massive amounts of data
- Built-in backup and disaster recovery
- Quick and easy data access
- Faster time to insights

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How ECS Works

The web browser uploads the picture directly to ECS

STEP 1

The application generates the signature and sends it to the web browser.

STEP 2

Start with a monolithic application running on vSphere

STEP 3

Replace file storage by object storage to be PaaS ready

STEP 4

Extract some features and run them as micro services on a PaaS.

STEP 5

Follow this process until all the features are micro services

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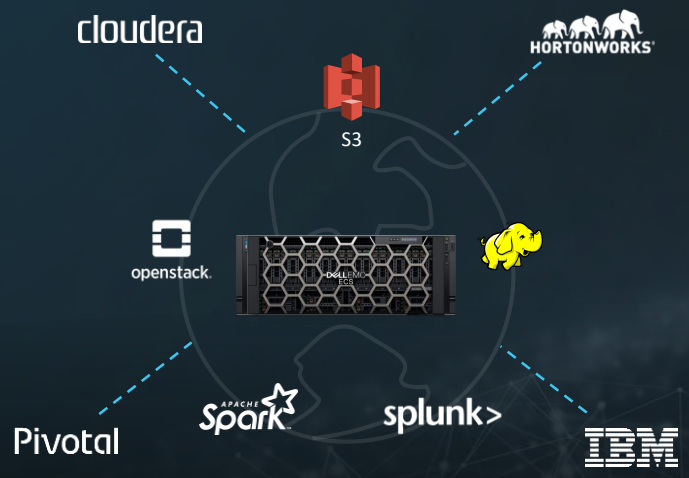
Analytics

Analyzing big data with global Hadoop.



KEY FEATURES

- Active-Active geo-distributed Hadoop with strong consistency
- Single global namespace
- Supports billions of objects both large and small
- Multi-protocol support
- 4.5 times better efficiency than HDFS with 3 sites

BENEFITS

- 48% lower TCO than public cloud providers
- Faster time to insights
- Simplified architecture
- Limitless scale

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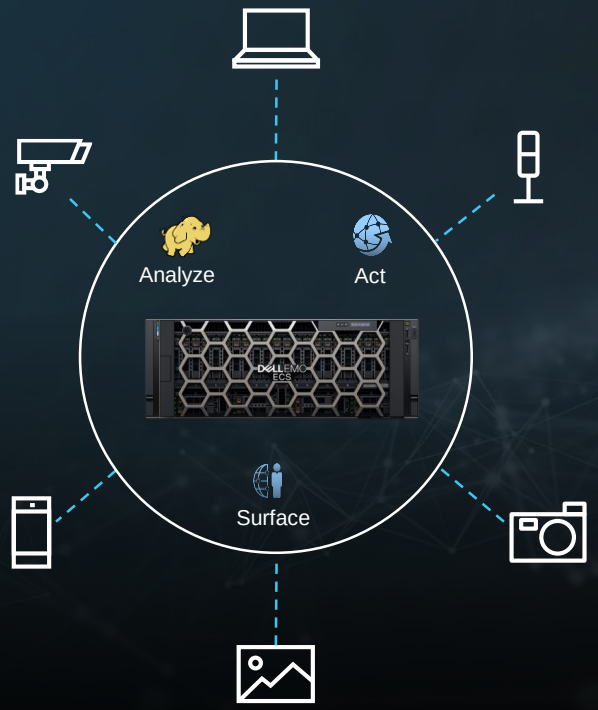
IoT – One Storage for All Things

Simplify your workflow, do more with your data

INGEST

STORE



KEY FEATURES

- One object storage that can handle very large files and billions and trillions of small files
- Internet-based global access
- Single global namespace with direct HTTP access to IoT data
- Natively supports RESTful object protocols such as OpenStack Swift, S3, Atmos and CAS
- In-place analytics with systems like Hadoop

BENEFITS

- Faster time to market
- Analytics-ready
- Limitless scale
- Efficient multi-site data protection

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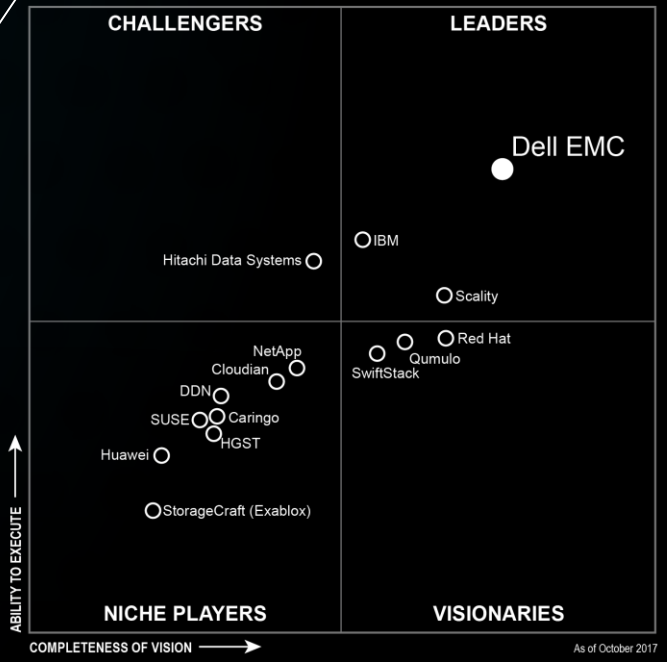
The Recognized Leader in Gartner MQ

2nd Straight Year

- Reflects on both product capabilities (“Completeness of vision”) and company (“Ability to Execute”)
- Based on both Isilon and ECS
- ECS: specifically for next-generation apps that demand massive capacity, global access and cloud-scale economics

“ECS has a well-designed architecture, built by engineers who were responsible, in part, for building early parts of Microsoft Azure. The distributed, pragmatic designs used by public cloud IaaS providers are also found in ECS.”

— Gartner Magic Quadrant Report 2017



Gartner

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ECS Momentum

RECOGNIZED BY TOP ANALYSTS

Gartner

"ECS has a well-designed architecture, built by engineers who were responsible, in part, for building early parts of Microsoft Azure. The distributed, pragmatic designs used by public cloud IaaS providers are also found in ECS."

IDC
Analyze the Future

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

ESG
Enterprise Strategy Group

"With the new ECS EX-Series, I believe Dell EMC will help organizations overcome these challenges with an affordable, flexible, and scalable unstructured storage solution."
– Scott Sinclair

OVER 1000 CUSTOMERS ARE USING ECS

DRAPER

"Today, we complete our daily backups in just 6 hours with ECS, instead of the 12 or more it took before."

IRON MOUNTAIN

"Our customers trust that we know where the data is by having those cloud-based solutions in our datacenters. It gives them a peace of mind where they know where their data is at rest."

Justdial
India's No.1 local search engine

"We were always looking for in-house cloud-based storage – reason being data credibility is the highest concern for us. Now, we will be putting all of our archival data on ECS which will reduce our storage management costs by 80%."

ECS IS COMPATIBLE WITH THE TOP ISVS

VERINT
cloudboost
Datadobi
IBM InfoSphere Optim
COMMVAULT
syncplicity
CLOUDARRAY
NICE
HORTONWORKS
FILENET
splunk>
IBM Spectrum Protect
IBM InfoSphere Optim
OPENTEXT
VERITAS
OnBase by Hyland
syncplicity by axway
Interlock Technology
Archive Migration Specialists

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Complete Off-the-shelf Solution for Storage-as-a-Service

HORTONWORKS cloudera Pivotal

In-place Analytics on Geo-distributed Data

IoT Data Repository

Cloud Gateway

Back-up and Archiving

OBJECT AS A SERVICE

ECS

https://accesspoint.yourdomain.com

Backup LTR

CloudPools

CloudBoost

CLOUD TIERING TARGET

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Benefits of ECS vs. Public Cloud

TCO

- Up to 48% lower TCO over public cloud*
- No cost/TB to tier data to ECS

*ESG

DATA RESIDENCY RISK

No data residency risk – deployed in customer's own data center

CUSTOMER EXPERIENCE

Single vendor simplicity with EMC, no multi-vendor complexity

PERFORMANCE /LATENCY

Co-located Isilon and ECS can eliminate up to 300 – 400 ms of potential network latency with AWS

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Why object storage is ideal for modern apps

Access Method	HTTP	
Access From	Any site	• The same application can run on any site which provides native high availability and faster response time for the users • No need to mount (and keep mounted) LUNs/File Systems to access data
Provisioning	No	• The application team can access storage on demand
WAN Friendly	✔	• The application and the storage can be on different sites which allows many new use cases like archiving data on many sites to a central location
Developer Friendly	✔	• Developers just need to download the SDK corresponding to the language he wants to use and doesn't have to manage any file system structure • They can also read/write data in all locations simultaneously with ECS' active/active global namespace • Reduce the amount of code - writing S3 Object requires in some cases 1000x less code than writing to block/file
User Metadata	✔	• Information about the objects can be stored as a metadata instead of being stored in an expensive database
Great scalability	✔	• Infinite scale - no capacity, site, or object limits

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ECS provides the foundation for modern apps

Allowing organizations to modernize applications and build cloud native apps

H/W Vendor Agnostic

Scale out

API driven

Low overhead

Software-defined

Multi-tenant or Private

WAN-efficient

Active-active

Geo-accessible

Strong Consistency

Large/Small Files

Policy Driven

You Control Where, How, and, When you move

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Additional Resources:

Watch the ECS Partner Video , visit the ECS Object Storage Knowledge Center and the Partner Portal for more partner-specific resources.

- Dell EMC ECS EX-Series Data Sheet
- Dell EMC ECS EX-Series Spec Sheet
- Accelerate Digital Transformation with Dell EMC ECS EX-Series Video
- https://ecs-sizing.cfcp.isus.emc.com/
- ECS vs Google Cloud CTS Calculator
- ECS vs AWS CTS Calculator
- ECS vs Azure CTS Calculator