Services Overview

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1. Big Data & Storage

3Vs of Big Data

source : www.datasciencecentral.com
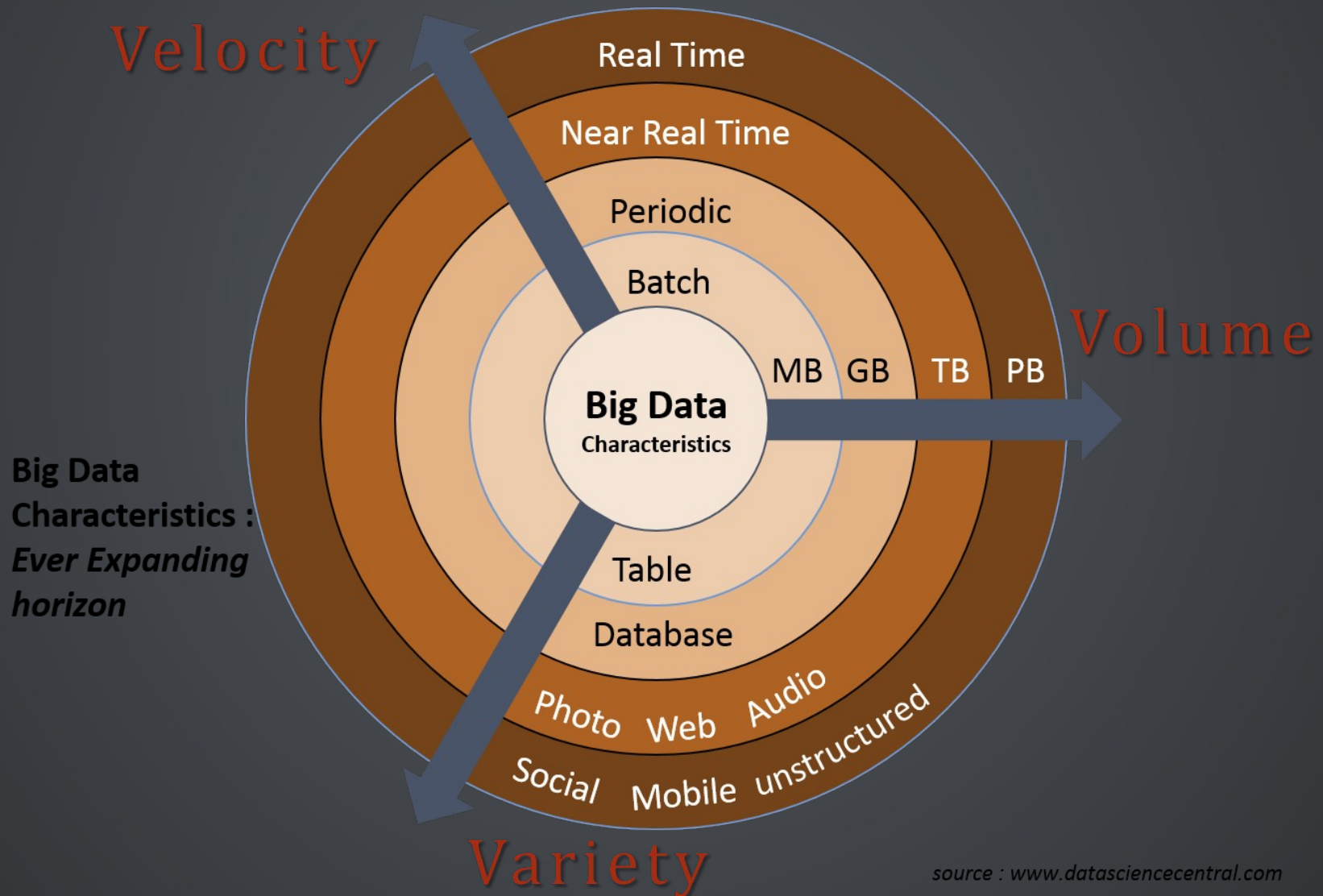
DATA CENTRIC

Compute centric:

Bring the **data** to the **computation**

Data centric:

Bring the **computation** to the **data**

Hardware Infrastructure

- 38 nodes: 4 masters + 34 slaves

  Storage capacity **816TB**

  Aggregated I/O throughput **30GB/s**

  64GB RAM per node

  10GbE connectiviy between all nodes

Hardware Master Nodes

- Model: Lenovo System x3550 M5
- CPU: 2x Intel Xeon E5-2620 v3 @ 2.40GHz
- Cores: 12 (2x6)
- HyperThreading: On (24 threads)
- Total memory: 64GB
- Network: 1x10Gbps + 2x1Gbps

Disks: 8x480GB **SSD** SATA 2.5" MLC G3HS

Controller: M5210 1GB Cache **FastPath**

Hardware Slave Nodes

- Modelo: Lenovo System x3650 M5
- CPU: 2x Intel Xeon E5-2620 v3 @ 2.40GHz
- Cores: 12 (2x6)
- HyperThreading: On (24 threads)
- Total memory: 64GB
- Network: 1x10Gbps + 2x1Gbps
  Disks: 12x 2TB NL **SATA** 6Gbps 3.5" G2HS
- Controller: N2215 SAS/SATA HBA

BD|CESGA Software

- Hadoop Platform
- PaaS Platform

Hadoop Platform

- HDFS
- MapReduce
- Hive
- HBase
- Kafka
- Spark

PaaS Platform

- MongoDB
- Cassandra
- PostgreSQL
- MariaDB
- etc

Parallel Storage

- HDFS
- Ceph
- Lustre

Lustre FT2

- 4xOSS Servers
- 2xMDS Servers
- 8xNetApp E5600 (OSTs):
  - 480x2TB HDD SAS 7200 RPM
- 1xNetApp E2724 (MDS):
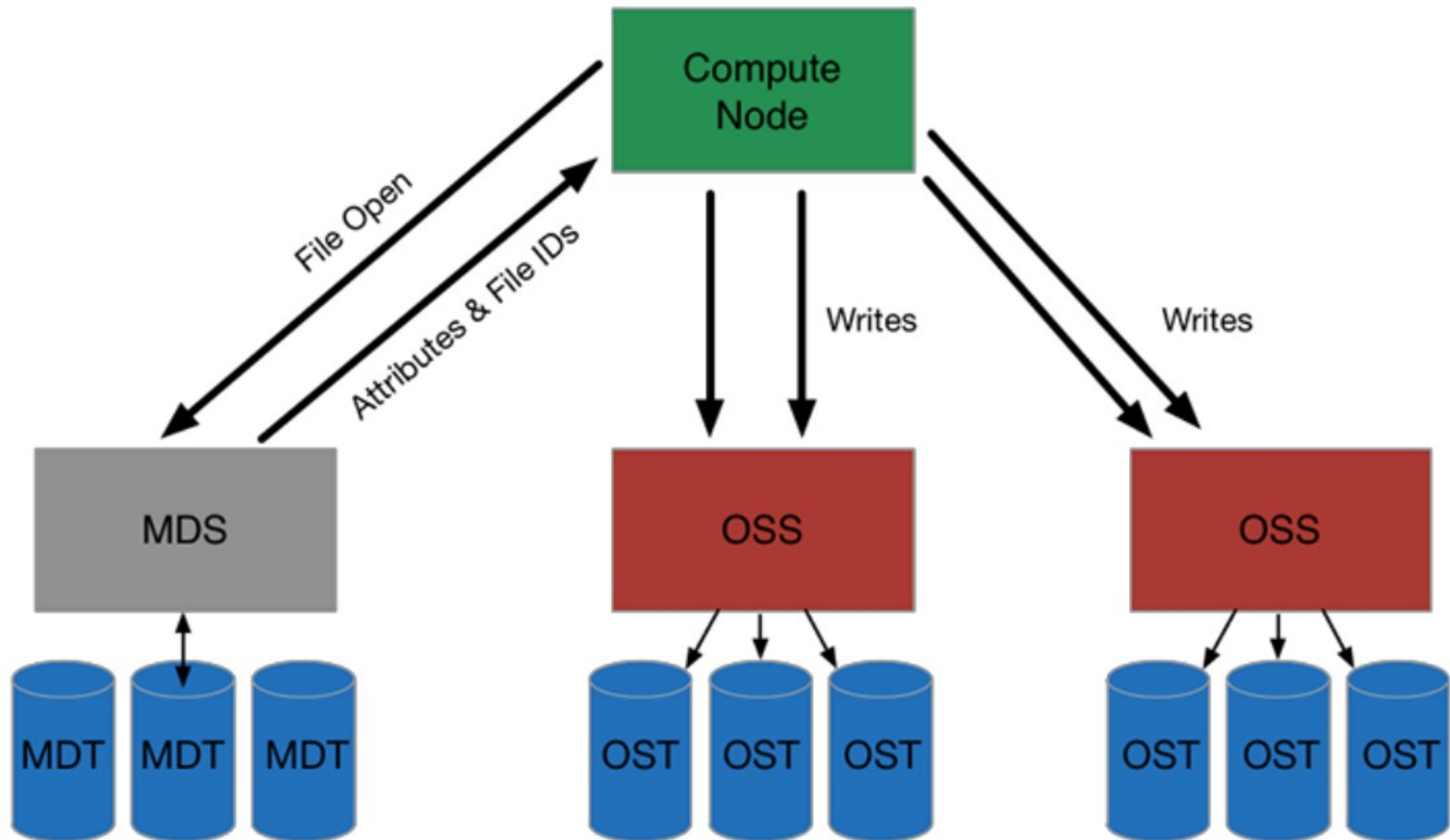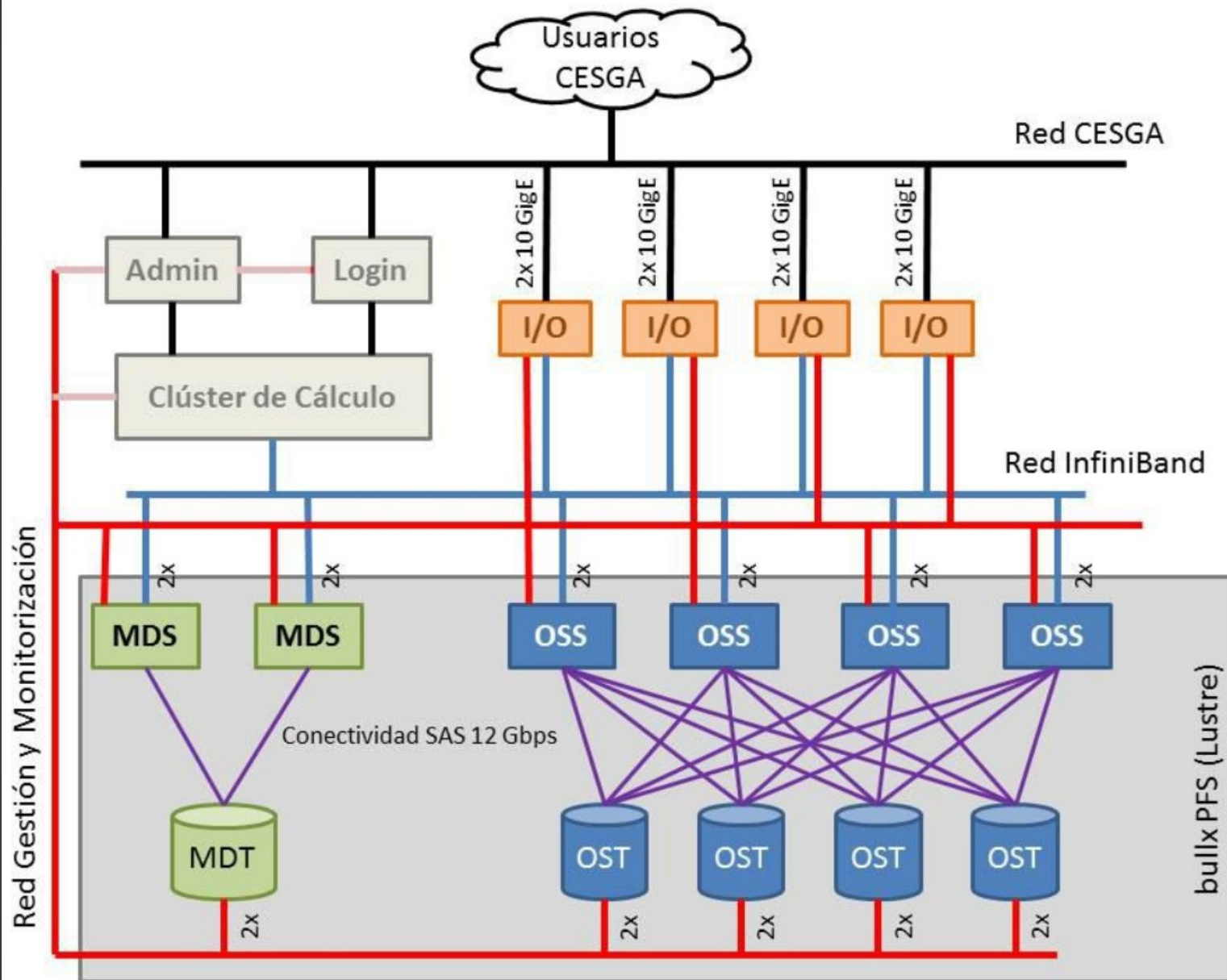 - 24x1TB HDD SAS 10.500 RPM

Lustre FT2

Bandwidth: **24GB/s**

Capacity: **695TB**

Connectivity: **Infiniband FDR 56Gbps**

Lustre

FT3 Storage

Almacenamiento de altas prestaciones

Lustre 1 PB

Almacenamiento de alta capacidad

Sistema de almacenamiento permanente de datos en disco

4 PB Lustre + HSM (Robinhood + QSTAR)

Sistema de almacenamiento permanente en cinta

20 PB

Librería de cintas

12x LT09 + 4x LT06

1600 slots

Backups: Tape Library

Netapp FAS9000HA

Big Data/FT2/FT3 HOME

- High availability
- High cost
- Lower parallel performance

Netapp

Bandwidth: **14GB/s**

Capacity: > **1PB**

Performance: **1.5M IOPS**

24 x 10GbE

SSD 24 x 960GB

SSD 24 x 960GB

SAS 12 x 1.8TB

SAS 24 x 1.8TB

SAS 24 x 1.8TB

SAS 24 x 1.8TB

SAS 24 x 1.8TB

FAS9000HA

SAS 24 x 1.8TB
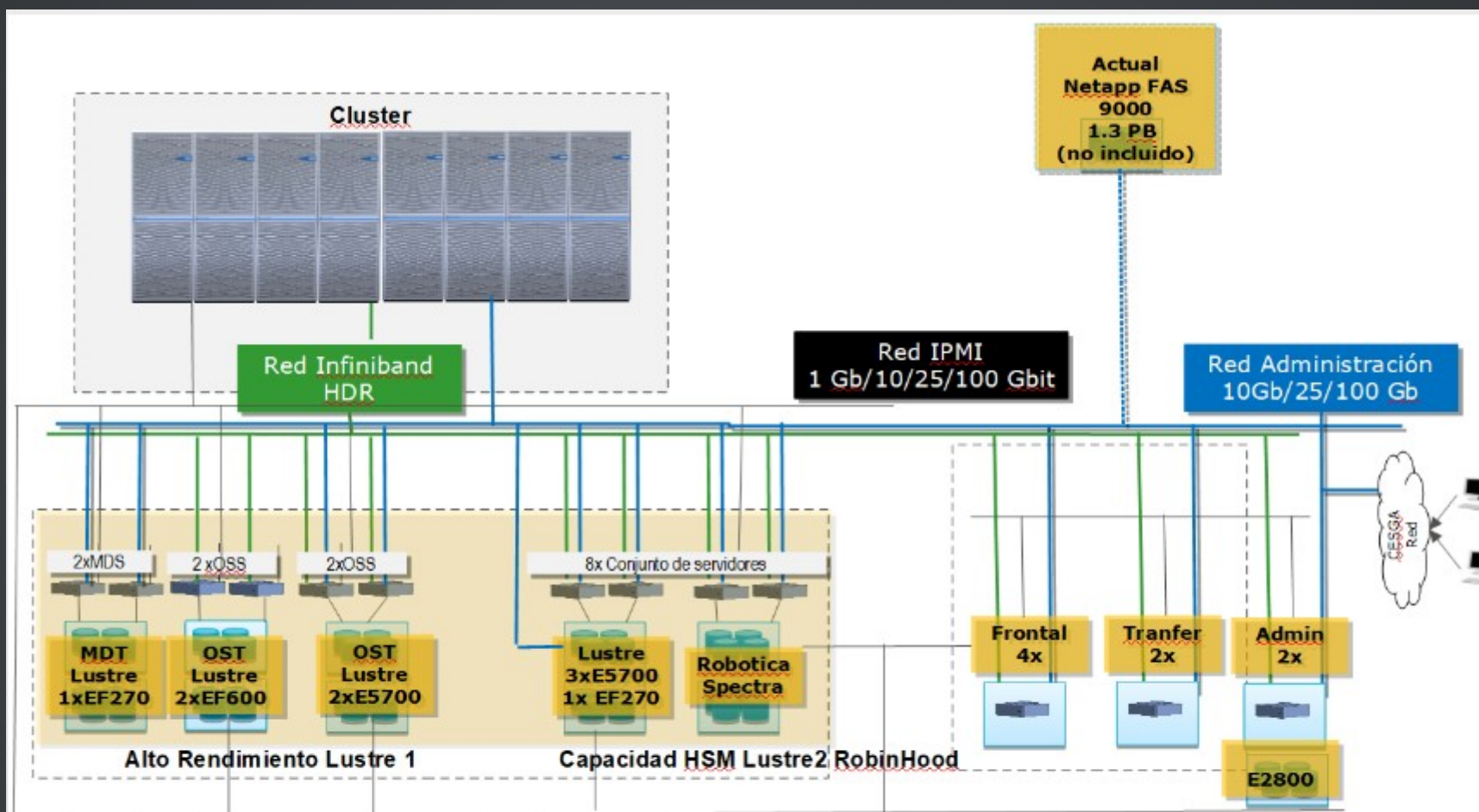
SAS 24 x 1.8TB

SAS 24 x 1.8TB

SAS 24 x 1.8TB

NL-SAS 60 x 10TB

NL-SAS 60 x 10TB

2. Computing

FinisTerrae III (FT3)

- 708 x procesadores Intel Xeon Ice Lake 8352Y de 32 cores, 2.2GHz

- 22.656 núcleos de proceso (cores)

- 144 aceleradores matemáticos GPU Nvidia A100 y Nvidia T4

- 118 TB de memoria agregada

- 355 TB capacidad agregada en discos SSD NVMe

- Red Infiniband HDR 100

Potencia de cómputo de 4 PetaFLOPS

	Thin nodes	GPU nodes	Viz nodes	Fat nodes	Transfer nodes	QLM node
Cantidad	256	64	16	16	2	
Procesador	2x Intel Xeon Ice Lake 8352Y 32 cores 2.2 GHz					Simulador de circuitos cuánticos Atos 30 qbits
Cores	64					
Memoria	256 GB			2 TB	256 GB	
Disco local	960 GB SSD NVMe			1920 GB SSD NVMe	960 GB SSD NVMe	
GPU		2x Nvidia A100	Nvidia T4			
Red baja latencia	Infiband HDR 100					

3. Cloud

	Cloud 1	Cloud 2	Cloud 3
Year	2009	2013	2021
Cores	1.200	1.464	6.240
Memory	2,4 TB	3,5 TB	24 TB
Storage	5,6 TB	63 TB	3.000 TB
Software	Opennebula 1	OpenNebula 5	OpenStack Xena