

## iris cluster characteristics

**Computing:** 196 nodes, 5824 cores; 96 GPU Accelerators -  $R_{peak} \approx 1072$  TFlops

**Storage:** 4260 TB (GPFS) + 1302 TB (Lustre) + 6400TB (Isilon) + 1608TB (backup)

@ Internet

Uni.lu  
Internal Network

Uni.lu (Belval)  
**Iris cluster**

@ Restena  
UL external

UL internal  
(Local)



ULHPC Site router

2x 10 GbE

2x 40 GbE QSFP+

10 GbE SFP+

lb1, lb2...

**Load Balancer(s)**

(SSH ballast, HAProxy,  
Apache ReverseProxy...)

access1



access2

2x Dell R630 (2U)  
(2\*12c Intel Xeon E5-2650 v4 (2,2GHz)

**User Cluster Frontend Access**

Fast local interconnect  
(Fat-Tree Infiniband EDR)  
100 Gb/s

adminfront1



adminfront2

slurm1 puppet1 dns1

brightmanager1 ...

dns2 puppet2 slurm2

... brightmanager2

2x Dell R630 (2U)  
2\*16c Intel Xeon E5-2697A v4 (2,6GHz)

storage1

Dell R730 (2U)  
(2\*14c Intel Xeon E5-2660 v4@2GHz)  
RAM: 128GB, 2 SSD 120GB (RAID1)  
5 SAS 1.2TB (RAID5)

sftp/ftp/pxelinux, node images,  
Container image gateways  
Yum package mirror etc.

storage2

2 CRSI 1ES0094 (4U, 600TB)  
60 disks 12Gb/s SAS JBOD (10 TB)

### CDC S-02 Belval - 196 computing nodes (5824 cores)



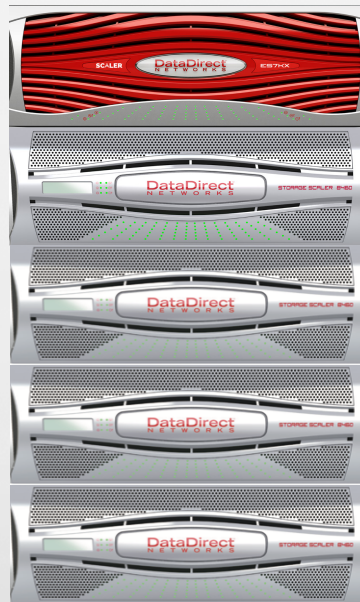
42 Dell C6300 encl. - 168 Dell C6320 nodes **[4704 cores]**  
108 x (2 \*14c Intel Xeon Intel Xeon E5-2680 v4 @2.4GHz), RAM: 128GB / 116,12 TFlops  
60 x (2 \*14c Intel Xeon Intel Xeon Gold 6132 @ 2.6 GHz), RAM: 128GB / 123,65 TFlops

24 Dell C4140 **GPU nodes [672 cores]**  
24 x (2 \*14c Intel Xeon Intel Xeon Gold 6132 @ 2.6 GHz), RAM: 768GB / 49,45 TFlops  
24 x (4 NVidia Tesla V100 SXM2 16 or 32GB) = 96 GPUs / 748,8 TFlops

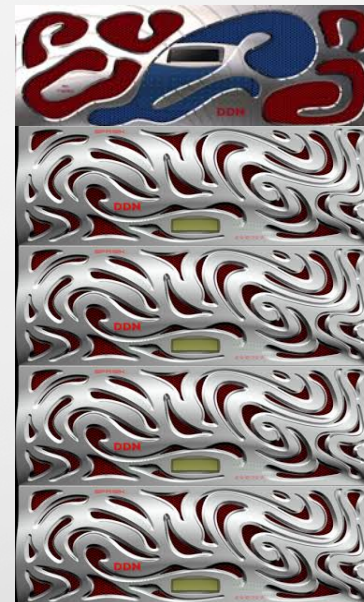
4 Dell PE R840 **bigmem nodes [448 cores]**  
4 x (4 \*28c Intel Xeon Platinum 8180M @ 2.5 GHz), RAM: 3072GB / 32,97 TFlops

### GPFS/SpectrumScale Storage (\$HOME, projects data) 4260 TB (raw), 3408 TB (effective)

2x NAS/NFS Protocol Servers



DDN GridScaler 7K (24U)  
1xGS7K base + 4 SS8460 expansion  
350 disks (6 TB SAS SED, 35 RAID6 pools)  
28 disks SSD (400 GB, 14 RAID1 pools)



DDN GridScaler 7990 (24U)  
1xGS7990 base + 4 SS9012 expansion  
360 disks (6 TB SED NL-SAS, 36 RAID6 pools)  
10 disks SAS-SSD (3.2 TB, 1 RAID6 pool)

### EMC ISILON NAS Storage (6400TB)



### DDN / Lustre Storage (1300 TB)

mds1

oss1

Dell R630, 2x[8c] Intel E5-2667v4@3.2GHz  
Dell R630XL, 2x[10c] Intel E5-2640v4@2.4GHz  
RAM:128GB

(Internal Lustre) Infiniband FDR

DDN ExaScaler7K(24U)

2x SS7700 base + SS8460 expansion  
OSTs: 167 (83+84) disks (8 TB SAS, 16 RAID6 pools)  
MDTs: 19 (10+9) disks (1.8 TB SAS, 8 RAID1 pools)

mds2

oss2

