

Cross-Forest

INEA/CEF/ICT/A2017/1566738

Project Closure Event. June, 23th 2021

**Use of HPC (High Performance Computing)
resources in Cross-Forest**



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SCAYLE Highlights

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Calendula supercomputer

- **345** servers
- **18.880 GB** RAM memory
- **6336** processing units (cores)
- **V100 GPUs** for Machine Learning / Deep Learning

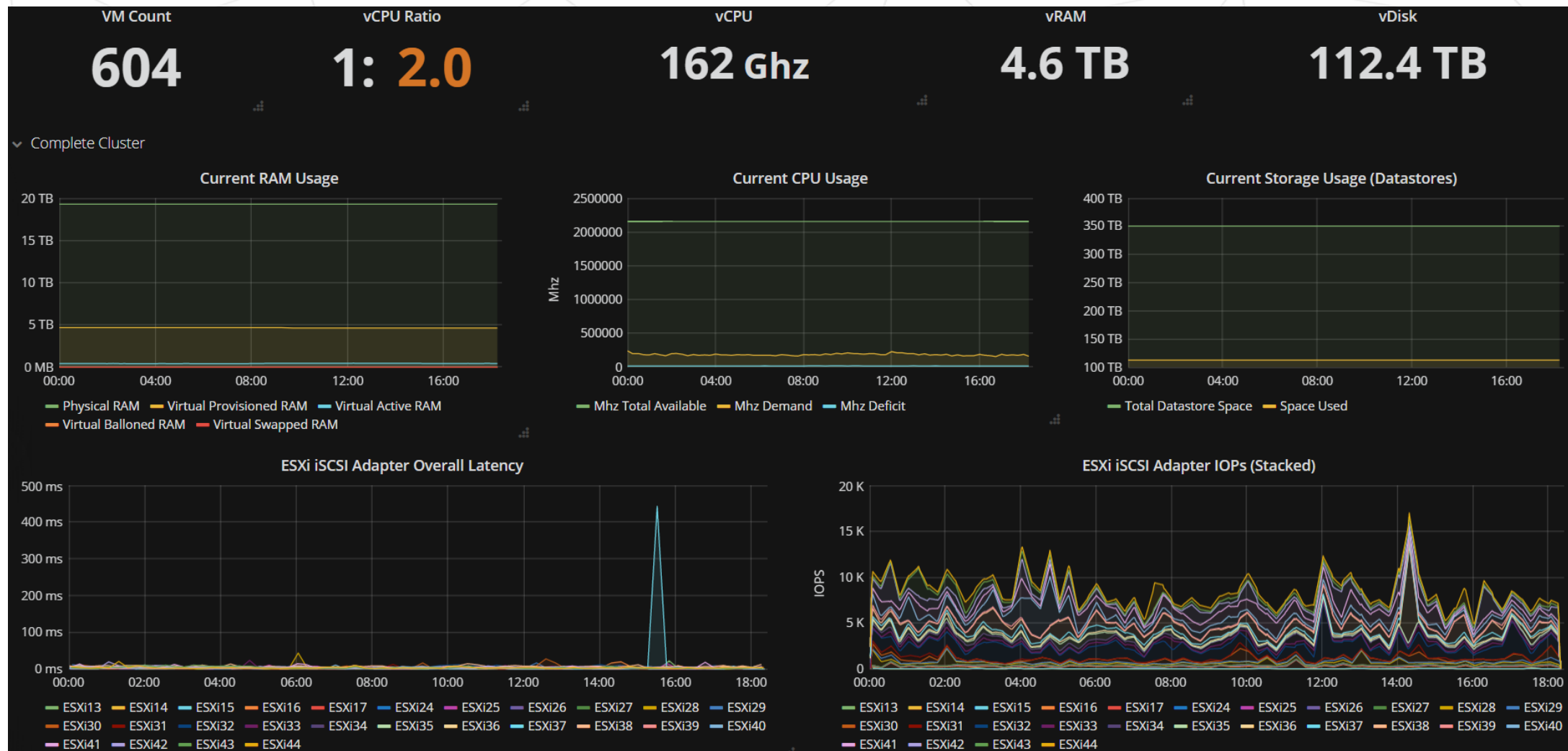
397 TFLOPS

397×10^{12} operations per seconds



Cloud computing

SCAYLE Highlights



SCAYLE Highlights



Infraestructuras
Científicas y Técnicas
Singulares

RES member

Red Española de Supercomputación
Spanish Supercomputing Network



www.res.es





HPC Facilities. CAMBRIC





Migration from SIMANFOR (Sistema de Simulación de Manejo Forestal Sostenible) **serial** original version to HPC **parallel** version



Old code Windows based to multiplatform and portable Python language using DASK framework (from one computer to hundreds of compute servers)



Compute infrastructure

114 compute servers

- Haswell processor architecture
- 2 processors Intel Xeon E5-2630 8 cores @ 2.40 GHz (1824 total)
- 32 GB RAM memory
- Infiniband FDR 56Gb/s



To use HPC infrastructure you need to submit your jobs to a workload manager, which submits them on your behalf to a assigned set of servers

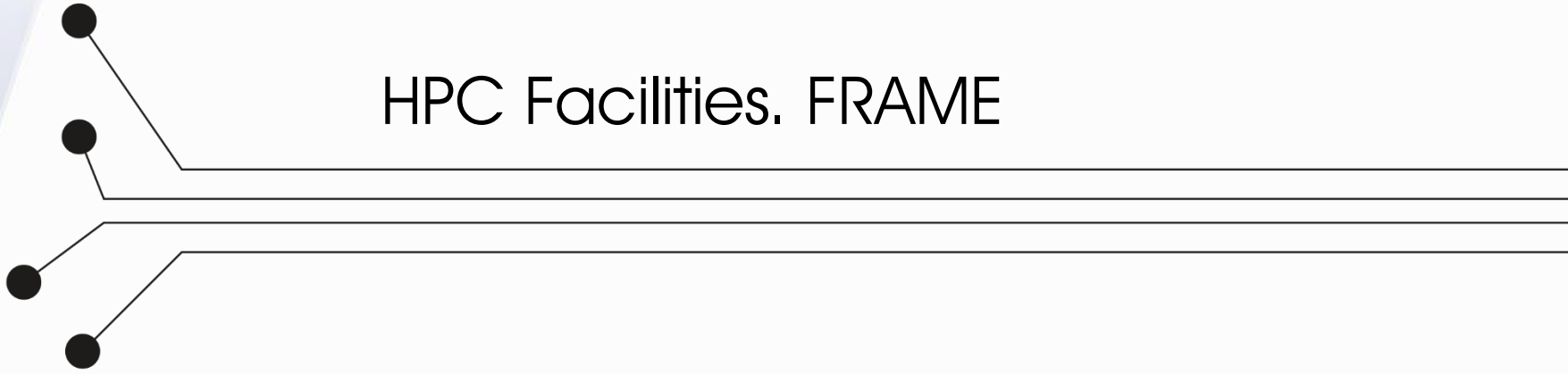
```
#!/bin/bash
#SBATCH -n 1
#SBATCH -p haswell
#SBATCH -q normal
#SBATCH -J sm4_simul_sim010-from1to22500
#SBATCH --time=120:00:00
#SBATCH -o sm4_simul_sim010-array_%A_%a.o
#SBATCH -e sm4_simul_sim010-array_%A_%a.e
#SBATCH -D .
```

#SBATCH --array=1-22500 ← SLURM Job Array

```
ROOT=/home/uva_iufor_1/uva_iufor_1/simanfor/simulator
SCNR=/scratch/uva_iufor_1/uva_iufor_1/sim010/scenario/scnr_sp999_${SLURM_ARRAY_TASK_ID}_4-100.json
module load python_3.7.7
python $ROOT/src/main.py -s $SCNR -logging_config_file $ROOT/config_files/logging.conf
```



HPC Facilities. FRAME





HPC Facilities. FRAME



HPC Facilities. FRAME

```
#!/bin/bash
```

```
#SBATCH --time=1:00:00 # walltime limit (HH:MM:SS)
```

```
#SBATCH --job-name="FireEngine"
```

```
#SBATCH -o %x-%j.log
```

```
#SBATCH -p cascadelake
```

```
#SBATCH -D /home/tragsatec_sig/SCAYLE2/
```

```
#SBATCH -n 1
```

```
#SBATCH -c 18
```

```
#SBATCH --mem=0
```

```
cd /home/tragsatec_sig_1/SCAYLE2/bin
```

```
srun ./FireEngine.App 5000.json
```

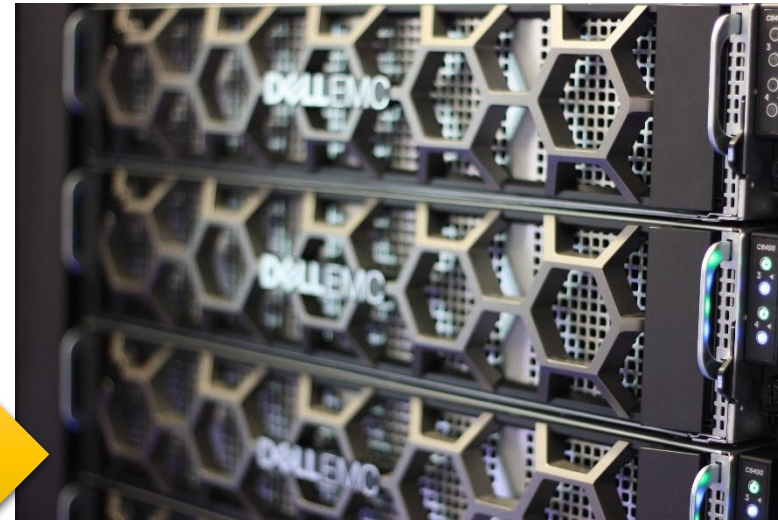
```
Tick() TODO - 0:0:0.68 - 2021-02-05 07:29:53  
Tick() TODO - 0:0:0.94 - 2021-02-05 07:29:54  
Tick() TODO - 0:0:0.78 - 2021-02-05 07:29:54  
Tick() TODO - 0:0:0.97 - 2021-02-05 07:29:55  
Tick() TODO - 0:0:0.73 - 2021-02-05 07:29:55  
Tick() TODO - 0:0:0.72 - 2021-02-05 07:29:56  
Tick() TODO - 0:0:0.65 - 2021-02-05 07:29:56  
Tick() TODO - 0:0:0.81 - 2021-02-05 07:29:57  
Tick() TODO - 0:0:0.72 - 2021-02-05 07:29:57  
Tick() TODO - 0:0:0.100 - 2021-02-05 07:29:58  
Tick() TODO - 0:0:0.76 - 2021-02-05 07:29:58  
Tick() TODO - 0:0:0.102 - 2021-02-05 07:29:59  
Tick() TODO - 0:0:0.71 - 2021-02-05 07:29:59  
Tick() TODO - 0:0:0.73 - 2021-02-05 07:30:00  
Generar geometrías 05/02/2021 07:30:00  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
Fin 5000: 09/06/2021 18:23:52 (00:12:57.3218011)  
Salida: /home/tragsatec_sig_1/SCAYLE2/output/5000(7).out
```

Interconnection between 2 SCAYLE services:

SCAYLE cloud



SCAYLE High Performance Computing



ultime limit (HH:MM:SS)

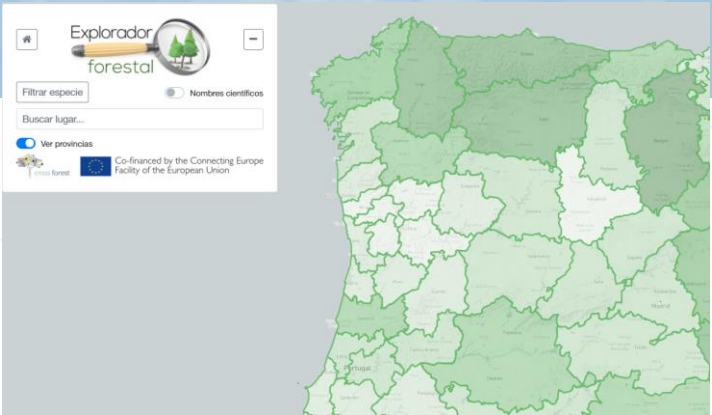
```
#SBATCH -D /home/tragsatec_sig/tragsatec_sig_1/SCAYLE2/  
#SBATCH -n 1  
#SBATCH -c 18  
#SBATCH --mem=0
```

```
cd /home/tragsatec_sig_1/tragsatec_sig_1_3/SCAYLE2/bin  
srun ./FireEngine.App 5000.json
```




- Cloud Facilities
- Linked Open Data. Virtuoso Endpoints
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Cloud Facilities. Virtuoso



<https://forestexplorer.gsic.uva.es/explorer>



Hardware de máquina virtual

> CPU	16 CPU
> Memoria	320 GB
> Disco duro 1	1,86 TB
> Disco duro 2	1 TB
> Adaptador de red 1	V_PRJ_CROSSFOREST. (conectado)

Hardware de máquina virtual

> CPU	16 CPU
> Memoria	128 GB
> Disco duro 1	250 GB
> Adaptador de red 1	V_PRJ_CROSSFOREST. (conectado)





cross forest

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