

## TECHNICAL SHEET

### Call for Advanced Computing Projects (4<sup>th</sup> edition)

Ref: FCT/CPCA/2023/01

Under the terms of the Regulations for Advanced Computing Projects, the “Call Notice” document for the Call for Advanced Computing Projects is presented together with a technical sheet that includes the configuration of the available Hardware and Software within this call.

**Preliminary note:** the information presented in the technical sheet relates to the characteristics of each Advanced Computing Platform in its entirety, although only a part of the capacity will be made available in this call.

**Additional note on Deucalion:** When filling in the A3 application form, while sorting by platform preference, all approved projects that put the option "Deucalion - any partition" first will be primarily allocated to the ARM partition.

**Additional notes on MareNostrum 5:** When filling in the A3 application form, while sorting by platform preference, the options "MareNostrum 5 - GPP", "MareNostrum 5 - ACC", "MareNostrum 5 - any partition" will be available; for benchmarking purposes, free prior access may be required via EuroHPC calls; resources will be allocated in CPU core. hours with conversion to node.hours; technical support in the BSC for these projects will be limited to the 1st half of 2024; approved projects will have 12 consecutive months, without extensions, starting between August and October 2024 - dates to be confirmed;

## Computational Model: High Performance Computing (HPC)

- Hardware – A3 Access

Center & Platform	Deucalion <sup>1</sup>
Peak performance	10 PFLOP
Total Cores	78336 ARM e 68224 x86
Total Nodes	1632 (in the ARM partition) 500 (in the X86 partition) 33 (in the GPU partition)
CPU Type (compute nodes)	Fujitsu ARM A64FX processors (48-core) @2.0 GHz 2 AMD EPYC 7742 processors (64-core) @2.25 GHz
Memory (GB RAM/core)	32 GB HBM2 (in the ARM partition) 256 GB DDR4 (in the X86 partition) 512 GB DDR4 (in the GPU partition)
Disk storage	430 TB NVMe + 10 PB HDD

Storage limit	Variable
GPU	33
GPU Type	4x NVIDIA Ampere A100 40GB on 17 nodes 4x NVIDIA Ampere A100 80GB on 16 nodes
<i>Infiniband</i>	HDR 100 Gb/s
File System	LUSTRE
Job Queue Manager	SLURM

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<sup>1</sup> Indicated capacity available from April 2024, for accesses A0, A1 and A3, after confirmation of entry into production.

CPU core. hours available for 12 months	~ 300 million*
URL for more details	<a href="https://macc.fccn.pt/resources#deucalion">https://macc.fccn.pt/resources#deucalion</a>

Center & Platform	BSC – MareNostrum 5 <sup>2</sup>
Peak performance	314 PFLOP
Totais Cores	717 696 General Purpose partition (GPP partition) 71 680 Accelerated Partition (ACC partition)
Total Nodes	6408 (GPP partition) 1120 (ACC partition)
CPU type (compute nodes)	GPP - 2x Intel Sapphire Rapids 8480+ @2Ghz (112 cores node) + 72HBM nodes ACC - 2x Intel Sapphire Rapids 8460Y+ @2.3Ghz (64 cores node) com 4x Nvidia Hopper GPUs per node General Next generation (NGT GPP) and Accelerated Next Generation (NGT ACC) being installed
Memory (GB RAM/core)	Being updated
Disk storage	248 PB SSD/Flash and hard disks, 402 PB tapes GPP - 960GB on NVMe storage ACC - 460GB on NVMe storage
Storage limit	Variable
GPU	Being updated
GPU Type	ACC - Nvidia Hopper
Infiniband	Being updated
File system	Being updated
Job Queue Manager	SLURM
CPU core. hours available for 12 months	Being updated*
URL for more details	<a href="https://www.bsc.es/marenostrum/marenostrum-5">https://www.bsc.es/marenostrum/marenostrum-5</a>

- Hardware – Acessos A2

Center & Platform	LCA-UC - Navigator/Navigator+
Peak performance	86 + 161,2 TFLOPS
Total Cores	3936 + 1280
Total Nodes	192
CPU Type (compute nodes)	2 x Intel Xeon E5-2697v2 (12-core)@ 2.70 GHz 2x Intel Xeon Gold 6148 (20-core)@ 2.40 GHz 4x Intel Xeon Gold 6154 (18-core)@ 3 GHz – SMP node
Memory (GB RAM/core)	4, 8 (7 nodes) / 55 (1 SMP node)
Disk storage	220 TB + 1,27 PB
Storage limit	Variable
GPU	8+2 visualization

<sup>2</sup> Indicated capacity available from March 2024, for A3 accesses, after confirmation of entry into production.

GPU type	Nvidia Tesla V100 16GB/ Nvidia A40 48GB for visualization
Infiniband	FDR 56 Gb/s + EDR 100Gb/s
File system	LUSTRE
Job Queue Manager	SLURM
CPU core. Hours available for 12 months	24 million
URL for more details	<a href="https://www.uc.pt/lca/ClusterResources/Navigator/description">https://www.uc.pt/lca/ClusterResources/Navigator/description</a>

Center & Platform	HPC-UÉ Oblivion
Peak performance	306 TFLOPS
Total Cores	3168
Total Nodes	88
CPU type (compute nodes)	2x Intel Xeon Gold 6354 (36-core) @ 3GHz
Memory (GB RAM/core)	5.33 e 7.1
Disk storage	1.15 PB
Storage limit	Max: 100TB per project (can be increased if necessary)
GPU	----
GPU type	----
Infiniband	EDR HCA
File system	BeeGFS
Job Queue Manager	SLURM
CPU core. hours available for 12 months	25 million
URL for more details	<a href="https://oblivion.hpc.uevora.pt">https://oblivion.hpc.uevora.pt</a>

Center & Platform	INCD - Cirrus-A e Cirrus-D <sup>3</sup>
Peak performance	---
Total Cores	1920 + 4032
Total Nodes	20 + 42
CPU type (compute nodes)	2x AMD EPYC 7643 2.3GHz (48-core) @2.3GHz
Memory (GB RAM/core)	5 GB (512GB per server) 10 GB em dois dos nós do Cirrus-D (1TB per server)
Disk storage	1,6 PB Cirrus-A + 1 PB Cirrus-D
Storage limit	Variable
GPU	8
GPU type	Nvidia Tesla T4, V100S e A100
Infiniband	FDR 56 Gb/s Cirrus-A HDR 200 Gb/s Cirrus-D
File system	LUSTRE
Job Queue Manager	SLURM

<sup>3</sup> Indicated capacity available from January 2024, after the new Cirrus-D cluster goes into production.

CPU core. hours available for 12 months	33,5 million Cirrus-D & 10 million Cirrus-A
URL for more details	<a href="#">Wiki INCD</a>

- GPU (*Graphic Processing Unit*)

Center & Platform	Deucalion
Model	Nvidia Ampere
Number of installed cards	33 (x4)
Maximum capacity available for 12 months	289 080 GPU.hours (~25%)

Center & Platform	BSC – MareNostrum 5
Model	Nvidia Hopper
Number of available cards	Being updated
Maximum capacity available in 12 months	Being updated

Center & Platform	LCA-UC - Navigator
Model	Nvidia Tesla V100 (8) Nvidia Tesla A40 for visualization (2)
Number of available cards	8+2
Maximum capacity available in 12 months	49 000 GPU.hours

Center & Platform	HPC-UE   Vision
Model	Nvidia A100 SXM4 40GB
Number of available cards	16
Maximum capacity available in 12 months	78 600 GPU hours

Center & Platform	INCD - Cirrus-A
Model	Nvidia Tesla T4 16GB (4) Nvidia Tesla V100S 32GB (2) Nvidia Tesla A100 80GB (2)
Number of available cards	8
Maximum capacity available in 12 months	70 000 GPU.hours

- Software

<b>Platform &amp; Center</b>	<b>Deucalion</b>
Software/Installed Modules	<a href="https://macc.fccn.pt/resources/software/">https://macc.fccn.pt/resources/software/</a>

<b>Platforma &amp; Center</b>	<b>MareNostrum5 - BSC</b>
Software/Installed Modules	<a href="https://www.bsc.es/marenostrum/marenostrum-5">https://www.bsc.es/marenostrum/marenostrum-5</a>

<b>Platform &amp; Center</b>	<b>Navigator - LCA-UC</b>
Software/Installed Modules	<a href="https://www.uc.pt/lca/ClusterResources/Navigator/programs">https://www.uc.pt/lca/ClusterResources/Navigator/programs</a>

<b>Platforms &amp; Centers</b>	<b>Oblivion / Vision - HPC-UE</b>
Software/Installed Modules	<a href="https://oblivion.hpc.uevora.pt/software-stack/">https://oblivion.hpc.uevora.pt/software-stack/</a> <a href="https://oblivion-docs.readthedocs.io/en/latest/modules.html#available-module">https://oblivion-docs.readthedocs.io/en/latest/modules.html#available-module</a> <a href="https://vistalab-vision.readthedocs.io/en/latest/software/software_list.html#list-of-software-modules">https://vistalab-vision.readthedocs.io/en/latest/software/software_list.html#list-of-software-modules</a>

<b>Platform &amp; Center</b>	<b>Cirrus - INCD</b>
Software/Installed Modules	<a href="https://wiki.incd.pt/books/software/page/software-list">https://wiki.incd.pt/books/software/page/software-list</a>

## Computational Models: **Scientific Cloud Computing (SCC)** or **Virtual Research Environment (VRE)**

<b>Platform &amp; Center</b>	<b>Stratus - INCD</b>
Type of distribution	openStack
Total Cores	1352 vCPUs
Total memory	4500 GB
File system	Ceph
Total storage	100 TB
Maximum Cores per VM	64 vCPUs
Maximum memory per VM	128 GB
Maximum disk per VM	Variable

Maximum capacity available in 12 months	10 million vCPU.hours
URL for more details	<a href="https://www.incd.pt/?p=servicos/cloud">https://www.incd.pt/?p=servicos/cloud</a> and <a href="https://wiki.incd.pt/shelves/cloud-user-documentation">https://wiki.incd.pt/shelves/cloud-user-documentation</a>

- **Contacts for further clarification**

	Deucalion	Navigator LCA-UC	Oblivion / Vision HPC-UE	Cirrus / Stratus INCD
E-mail	<a href="mailto:help@support.macc.fccn.pt">help@support.macc.fccn.pt</a>	<a href="mailto:helpdesk.lca@uc.pt">helpdesk.lca@uc.pt</a>	<a href="mailto:support@oblivion.uevora.pt">support@oblivion.uevora.pt</a> <a href="mailto:support@vision.uevora.pt">support@vision.uevora.pt</a>	<a href="mailto:helpdesk@incd.pt">helpdesk@incd.pt</a>
	MareNostrum 5			
E-mail	<a href="mailto:rnca@fccn.pt">rnca@fccn.pt</a> <a href="mailto:help@support.macc.fccn.pt">help@support.macc.fccn.pt</a>			

## Access policies and other useful documents

*Access Policies or Acceptable Use Policies (AUP)*

RNCA: [Access policy \(pt\)](#)

Deucalion: <https://docs.macc.fccn.pt/>

INCD: <https://www.incd.pt/?p=acceptable-use-policy> & <https://wiki.incd.pt/>

LCA-UC: <https://www.uc.pt/lca/policy>

HPC-UÉ: Contact the center directly.

*Last update: 27 November 2023*

Resources allocated to the call:

DEUCALION



Supported by:

